



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

SUSTAINMENT

MEMORANDUM FOR FILE

FROM: Michelle Volkema, Deputy Federal Preservation Officer, ODASD(Env) *MV*

SUBJECT: Redaction of "Historic Preservation Plan for the Kahuku Training Area, O'ahu, Hawai'i"

The following report, "Historic Preservation Plan for the Kahuku Training Area, O'ahu, Hawai'i," was redacted on March 12, 2019 in accordance with 16 U.S.C. §§ 470aa-470mm, the Archaeological Resource Protection Act. This redaction was performed by Courtney Williams, RPA, Staff Technical Specialist, Booz Allen Hamilton program support to OASD(S), pursuant to §470hh, "Confidentiality of information concerning nature and location of archaeological resources."

RECOMMENDATION: Affix this information memorandum as a cover sheet to the above-referenced report.

COORDINATION: None

Attachments: Redacted "Historic Preservation Plan for the Kahuku Training Area, O'ahu, Hawai'i"

Prepared By: Courtney Williams, Booz Allen Hamilton, Support to OASD(S)/Env

**Historic Preservation Plan
for the Kahuku Training Area, O`ahu, Hawai`i**

Prepared for:

U.S. Army Engineer District, Honolulu
Corps of Engineers, Bldg. 223
Fort Shafter, Hawai`i 96858-5440

Contract DACA83-91-D-0025
Delivery Order 0017

Prepared by:

Ogden Environmental and Energy Services Co., Inc.
680 Iwilei Road Suite 660
Honolulu, Hawai`i 96817

November 1996

Legacy Resource Management Program

Final Report

1. DoD Project Number: 930539
2. 1383 Number: None; proposal submitted by Pacific Ocean Division (POD), Corps of Engineers
3. Project Name: Cultural Resources Survey and Historic Preservation Plan, Kahuku Training Area
4. Service/MACOM/Installation/Location (State): U.S. Army/U.S. Army, Pacific/Kahuku Training Area/Hawaii
5. Continuation project: No.
6. Funding Information: Unknown.
7. Technical POC: Charles Streck, POC

Final Report:

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8. Objectives: Perform cultural resources survey (selected sample) and assess historic properties for the purpose of developing predictive site models and a Historic Preservation Plan for Kahuku Training Area.
9. Summary of any final changes to project funding, schedule, or scope: The project has encountered numerous delays. Final draft reports are being provided in anticipation that they will be accepted as final with very few changes.
10. Final deliverables/products: Historic Preservation Plan (HPP) and Archaeological Inventory Survey reports.
11. Methodology used to accomplish the project: Field surveys, assessment, predictive modeling, and preparation of an HPP.
12. List of non-Legacy sources of funds that contributed to completion of the project: None.

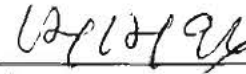
13. Project documentation and final product (enclosed).

Project Compliance Certification

I affirm that, to the best of my knowledge and belief, the requirements of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), other advisory, compliance, and coordination requirements have been met.



ALVIN L. CHAR
C, Conservation/Restoration Branch
Environmental Division
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U.S. Army Garrison, Hawaii



Date

93-0539

Historic Preservation Plan
for the Kahuku Training Area,
O`ahu, Hawaii

By
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November 1996

ACKNOWLEDGMENTS

The following individuals contributed to the completion of this revised draft report and deserve recognition and thanks. Chuck Streck and Kanalei Shun of the ACOE, Laurie Lucking DPW archaeologist, Rey Perez of Range Control, and Mark Ammen of New Perspectives Group. In addition, the following Ogden staff members also provided assistance, including; Jim Landrum who contributed background information, Dave Nichols for graphics, Cathleen Dagher for editing, and Kathleen Mattiello for word processing

EXECUTIVE SUMMARY

In 1966, the Congress of the United States passed the National Historic Preservation Act (NHPA). This act recognized that the spirit and direction of the United States are founded upon and reflected in its historic heritage, and that the historical and cultural foundations of the nation should be preserved whenever possible as a living part of community life and development, in order to give a sense of orientation to the American people. The NHPA made it Federal policy to administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations. The United States Army, as a Federal agency, is charged with ensuring that the intent and purpose of the NHPA is maintained on Army controlled installations, such as the Kahuku Training Area (KTA). This Historic Preservation Plan (HPP) has been prepared for use by the Commanding Officer and staff of KTA to help guide and advise them on their responsibilities and duties under the mandate of the NHPA, and to assist them with the protection, preservation, and enhancement of the prehistoric and historic resources under their jurisdiction.

This HPP is divided into six sections plus appendices. The Section 1.0 discusses the goals, policies, and priorities of the installation Commander and staff to ensure that the mandates of the NHPA are met. It includes legislation concerning historic preservation and outlines the assigned historic preservation responsibilities of KTA personnel. Section 2.0 provides a geographic and historical overview of KTA to help users of KTA understand the historical and cultural importance of the area. Section 3.0 provides the archaeological site inventory and evaluation for KTA. It includes a discussion of all archaeological investigations conducted at the installation including all recorded archaeological and historical sites, and significance assessments of each. A model of probability for unidentified archaeological resources is also presented. Section 4.0 outlines the land uses, potential and identified threats to archaeological and historical resources, and regulated activities at KTA. Section 5.0 consists of historic preservation activities necessary at KTA including Section 106 and 110 compliance procedures, periodic reporting to SHPD and ACHP, standards for archaeology and historic preservation activities, and Native Hawaiian coordination, NAGPRA, and burial treatment policies. Section 6.0 consists of recommendations and implementation plans, as well as Standard Operating Procedures for users of KTA regarding historic preservation.

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1.0 SCOPE AND OBJECTIVES

The United States Army Kahuku Training Area (KTA) contains numerous recorded significant archaeological and historical resources. In addition to the known archaeological and historical resources existing at KTA, there is a probability that undiscovered archaeological and historical resources also exist within the training area. These resources are important to the study of Hawaiian history, and therefore, steps must be taken to ensure their protection. It is the responsibility of the United States Army to protect and manage all such archaeological sites that are either eligible or potentially eligible for inclusion in the National Register of Historic Places. Implementation of the Standard Operating Procedures (SOP) outlined in this Historic Preservation Plan (HPP) will comply with federal laws and assist in the preservation and management of significant archaeological and historical resources located at KTA.

1.1 GOALS AND OBJECTIVES

This HPP is designed for use by the staff and user groups of KTA with the primary goal of promoting the military mission of the installation while ensuring compliance with historic preservation legislation, regulations, standards, and guidelines established to facilitate the preservation and management of historic properties under Federal jurisdiction. The HPP provides guidelines and Standard Operating Procedures (SOPs) necessary to preserve, maintain, and protect archaeologically and historically significant resources. These procedures must be followed in order for the United States Army to meet its legal responsibilities for the management of these resources. Another goal of this Historic Preservation Plan is to promote increased awareness of the archaeological and historical resources of the installation.

This plan also sets forth historic preservation priorities with respect for predicted future projects, tasks, and actions scheduled to be undertaken at KTA. It is important to note that this plan is intended to be used as a guideline, and that future unpredicted projects, tasks, and actions not identified in this document may address historic preservation management concerns through consultation with the designated KTA historic preservation personnel.

1.1.2 Promoting The Military Mission Of The Installation

The primary military mission of KTA is to provide training support to USARPAC units, the USN, the USMC, the USCG, the Reserve components, the National Guard and, when directed, to those countries in the Pacific Rim Allied to the United States. This is accomplished by scheduling,

managing, controlling, and maintaining ranges, maneuver areas, airspace, and training facilities, to include upgrading and construction of new facilities. Part of this mission includes compliance with federal legislation and regulations regarding historic preservation and environmental laws. By establishing and maintaining historic preservation programs, the military mission of KTA succeeds in preserving aspects of local cultural and historical heritage, and promotes opportunities for a better understanding of how and why the past is important today.

1.2 APPLICABLE FEDERAL LAWS AND U.S. ARMY POLICIES

Federal legislative and regulatory mandates define the historic preservation planning, development, and management processes with which the Army must comply when planning and undertaking projects, tasks, and actions on lands under Army jurisdiction. All personnel and user groups at KTA should be aware of the laws, regulations, standards, and guidelines established to assure the archaeology, history, and cultural heritage of all American citizens are protected. These laws, regulations, standards and guidelines set forth the historic preservation development review process and procedures that apply to all projects, tasks, and actions under Army jurisdiction. Applicable Federal laws include:

- The Antiquities Act of 1906
- The Historic Sites Act of 1935
- The National Historic Preservation Act (NHPA) of 1966, as amended
- The National Environmental Policy Act (NEPA) of 1969, as amended
- The Archaeological and Historic Preservation Act (AHPA) of 1974, as amended
- The Public Buildings Cooperative Use Act (PBCUA) of 1976
- The American Indian Religious Freedom Act (AIRFA) of 1978
- The Archaeological Resources Protection Act (ARPA) of 1979
- The Native American Graves Protection and Repatriation Act (NAGPRA) of 1989
- The Programmatic Memorandum of Agreement (PMOA) of 1986
- The Archaeological and Historic Data Preservation Act (AHDPA), as amended

- The Defense Environmental Restoration Program Act (DERPA; Public Law 91-190)

In addition to the above laws, Presidential Executive Order No. 11593 for the Protection and Enhancement of the Cultural Environment (issued in 1971) applies to historic resources. Applicable Army policy and regulations include: Department of Defense Directives 4710.1, Archaeological and Historic Resources Management; Directive 6050.1, Environmental Effects in the United States of DoD Actions; Army Regulation 200-2-2, Environmental Effects of Army Actions; Army Regulation 420-40, Historic Preservation; and Engineering Regulation 1105-2-50, Historic Preservation.

Additional applicable federal regulations include: 36 CFR 79, Curation of Federally-Owned and Administered Archaeological Collections (issued 12 September 1990); 41 CFR 101, Federal Property and Administrative Services; National Register Bulletin No. 16, Guidelines for Completing National Register of Historic Places Forms (issued 30 September 1986); National Register Bulletin No. 19 National Park Service Procedures and Policies for Processing National Register Nominations (issued July 1986), and National Register Bulletin No. 16A, How to Complete the National Register Registration Form (issued 1991). These legislative and regulatory mandates are briefly explained below.

1.2.1 Antiquities Act of 1906

This act authorizes the President to designate as National monuments historic sites and natural resources of national significance located on federally owned or controlled lands as National Monuments. The act further provides for the protection of all historic and prehistoric ruins and objects of antiquity located on Federal lands by providing criminal sanctions against excavation, injury, or destruction of such antiquities without the permission of the Secretary of the Interior having jurisdiction over such resources.

1.2.2 Historic Sites Act of 1935

This act allows for the designation of national historical sites and landmarks, encourages interagency efforts to preserve historic resources, and established fines for violations of the act. This act establishes as national policy the preservation for public use of historic resources by giving the Secretary of Interior the power to make historic surveys and to document, evaluate, acquire, and preserve archaeological and historic sites across the country. This act led to the

establishment within the National Park Service of the Historic Sites Survey, the Historic American Buildings Survey, and the Historic American Engineering Record.

1.2.3 National Historic Preservation Act (NHPA) of 1966, As Amended

The NHPA establishes policies that support and encourage the preservation of historic and prehistoric resources for present and future generations. These policies are accomplished by several means:

1. The act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places and it establishes procedures for nomination of properties to the Register.
2. The act directs the Secretary of the Interior to approve State preservation programs that provide for the designation of a State Historic Preservation Officer (SHPO) to administer State preservation efforts, a State preservation review board, and adequate public participation in the State program.
3. The act authorizes a grant program that provides funds to the States for historic preservation projects and to individuals for the preservation of properties listed in the National Register.
4. The act establishes the Advisory Council on Historic Preservation as an independent Federal agency. The act also directs the Advisory Council to advise the President, Congress, and other Federal agencies on historic preservation matters. The Advisory Council is responsible for implementation of Section 106 of the NHPA. Section 106 requires that Federal agencies take into account the effect of their undertakings on historic properties and to afford the Advisory Council an opportunity to comment on an undertaking.
5. The act establishes procedures that Federal agencies must follow in managing federally owned or controlled property. The act requires that Federal agencies must undertake such planning as necessary to minimize harm to National Historic Landmarks and must obtain the comments of the Advisory Council.
6. The act establishes a National Historic Preservation Fund.

Amendments of 1992 made several notable changes to the NHPA. These amendments clarify and expand the leadership role of the Federal Government in historic preservation administration and Native Americans and Native Hawaiians in the historic preservation process. Prior to these amendments, the term "State" referred to any State of the United States, the District of Columbia, the commonwealth of Puerto Rico, Guam, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territories of the Pacific Islands. With the 1992 amendments, the Trust Territories of the Pacific Islands were deleted and replaced by the Trust Territory of the Pacific Islands, and, upon termination of the Trusteeship Agreement for the Trust Territory of the Pacific Islands, the Republic of Palau. The term "State" also includes the Republic of the Marshall Islands and the Federated States of Micronesia.

The definition of the term "Tribe" was revised to include "...an Indian tribe, band, nation, or other organized group or community..." The definition was expanded to include any "...Native village, Regional Corporation, or Village Corporation," as defined in section 3 of the Alaska Native Claims Settlement Act. The terms "Native Hawaiian" and "Native Hawaiian organization" were also defined in the 1992 amendments. The Office of Hawaiian Affairs of the State of Hawaii and Hui Malama I Na Kapuna O Hawai'i Nei were recognized as "Native Hawaiian organizations."

The 1992 amendments recognize the traditional religious and cultural importance of properties Native Americans or Native Hawaiian organizations, and, in the case of the State of Hawaii, provides for consultation between the State Historic Preservation Officer and Native Hawaiian organizations.

1.2.4 National Environmental Policy Act (NEPA) of 1969, as amended

The National Environmental Policy Act (NEPA) directs agencies to administer Federal programs and resources to foster environmental quality and preservation. For major Federal actions significantly affecting the quality of the human environment, Federal agencies must prepare and make available for public comment an environmental impact statement. Compliance with NEPA may be done in coordination with compliance with the National Historic Preservation Act under the regulations of the Advisory Council on Historic Preservation, 36 CFR 800.

1.2.5 Archaeological and Historic Preservation Act (AHPA) of 1974

This act requires Federal agencies to notify the Secretary of the Interior when a proposed undertaking may pose a threat of irreparable loss or destruction of significant scientific,

prehistoric, historical, or archaeological data. This act also authorizes appropriations for preservation of data, surveys, and investigations of such projects.

1.2.6 Public Buildings Cooperative Use Act (PBCUA) of 1976

This act encourages the Federal agencies to reuse historic buildings for administrative facilities or activities, while maintaining their historical integrity.

1.2.7 American Indian Religious Freedom Act (AIRFA) of 1978

This act protects the inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians. These rights include freedom of worship through ceremonies and traditional rites, possession of sacred objects, and access to religious or sacred sites. This act also requires consultation with tribal leaders prior to the disturbance of human burial sites.

1.2.8 Archaeological Resource Protection Act (ARPA) of 1979

The Archaeological Resources Protection Act requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. Excavations must be undertaken for the purpose of furthering archaeological knowledge in the public interest, and resources removed remain the property of the United States. The act provides both civil and criminal penalties for violation of the permit requirements. The act also allows for confidentiality of information regarding the nature and location of archaeological resources. ARPA also requires that federal land managers establish programs to increase public awareness of the significance of archaeological resources and the need to protect them.

1.2.9 Native American Graves Protection and Repatriation Act (NAGPRA) of 1989

This act was established to set procedures to determine the ownership and disposition of Native American and Native Hawaiian human remains, funerary objects, sacred objects, or objects of cultural patrimony that are discovered on Federal property or are possessed by Federal agencies or federally supported institutions. NAGPRA also requires these entities to inventory their collections of human remains, funerary objects, sacred objects, and objects of cultural patrimony to determine ownership, and thereafter to repatriate them to the appropriate Native American organization in accordance to the law. The act also establishes penalties for those convicted of trafficking in Native American remains and cultural items.

1.2.10 Programmatic Memorandum of Agreement (PMOA) of 1986

All Department of Defense (DoD) World War II temporary buildings are covered by a Programmatic Memorandum of Agreement (PMOA) signed in July 1986. After Congress directed the DoD to demolish World War II temporary buildings as part of the Military Construction Authorization Bill of 1983, the PMOA instigated a nationwide research and documentation program intended to mitigate the impact of the demolition. Documentation must be in accordance with Historic American Building Surveys (HABS) standards as administered by the National Park Service. Some of the PMOA requirements have been completed, including the publication of *World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States* (Garner 1993). The U.S. Army Corps of Engineers' Construction Engineering Research Laboratories (CERL) has also documented or kept track of others' documentation of 113 World War II temporary building types, including the standard 16-foot-wide and a 40-foot-wide Quonset huts. Actions concerning unique temporary buildings must be reviewed on an individual basis by the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR).

1.2.11 Executive Order No. 11593 for the Protection and Enhancement of the Cultural Environment

This Presidential mandate was issued in 1971 and directs federal agencies to preserve, restore, and maintain cultural properties under their control, and establish implementation procedures to undertake the order. Importantly, the order specified that Federal agencies must

...with the advice of the Secretary of the Interior, and in cooperation with the liaison officer for historic preservation for the state or territory involved, locate, inventory, and nominate to the Secretary of the Interior all sites, buildings, districts and objects under their jurisdiction or control that appear to qualify for listing on the National Register of Historic Places.

1.2.12 Department of Defense (DoD) Directive 4710.1 Archaeological and Historic Resources Management

This DoD Directive, issued June 21, 1984, provides DoD policy, prescribes procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands under DoD control. This Directive orders, and assigns responsibilities to, the heads of the DoD components (e.g., Commanding General U.S. Army) to comply, and establishes procedures for compliance, with the National Historic Preservation Act, the Archaeological and

Historic Data Preservation Act, the Archaeological Resources Protection Act, Executive Order 11593, and DoD Directive 6050.1 (Environmental Effects in the United States of DoD Actions).

1.2.13 Defense Environmental Restoration Program Act (DERPA; Public Law 91-190)

This law orders all Department of Defense components (e.g., U.S. Army) to comply with the National Environmental Protection Act.

1.2.14 Army Regulation 200-2-2, Environmental Effects of Army Actions

This Army regulation, issued 23 December 1988, provides Army policy, prescribes procedures, and assigns responsibilities for the environmental management of waters and lands, projects, tasks, and actions under Army control in compliance with Department of Defense Directive 6050.1.

1.2.15 Army Regulation 420-40 Historic Preservation

This Army regulation, issued 15 April 1984, provides policy, prescribes procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands, projects, tasks, and actions under Army control in compliance with Department of Defense Directive 4710.1.

1.2.16 National Register Bulletin No. 16, Guidelines for Completing National Register of Historic Places Forms (issued 30 September 1986)

This document presents the standards and guidelines for completing National Register of Historic Places Forms in greater detail than the Secretary's guidelines.

1.2.17 National Register Bulletin No. 19 National Park Service Procedures and Policies For Processing National Register Nominations (issued July 1986)

This document presents the specific standards and guidelines for completing National Register of Historic Places Nomination Forms.

1.2.18 National Register Bulletin No. 16A, How to Complete the National Register Registration Form (issued 1991)

This document presents a step by step procedure for completing an National Register Registration Form.

1.3 ARMY POLICY

The Army policy for protecting and managing historic resources is defined by Regulation 420-40. Army policy for historic preservation can be summarized as:

- a) To inventory, evaluate, and protect historic resources located on lands controlled by the Army.
- b) To identify and nominate to the National Register all eligible historic resources on Army lands.
- c) To cooperate with Federal, state, and local agencies, Indian tribes, and the public in managing historic resources.
- d) To integrate historic preservation requirements with planning and management of other activities, and to consider historic resources during the earliest stages of project planning to reduce conflicts with the military mission and other management objectives.
- e) To maintain historic resources and promote their rehabilitation and adaptive reuse when feasible.
- f) To recognize the rights of American Indians to have access to certain religious sites and objects on lands under Army control within the limitations of the military mission.

1.4 ASSIGNED RESPONSIBILITIES

The Department of the Army has assigned responsibilities regarding historic preservation in Army Regulation 420-40. These responsibilities are outlined to ensure that historic preservation activities are conducted and are as follows:

1.4.1 The Assistant Secretary of the Army

The Assistant Secretary of the Army will direct and supervise matters pertaining to the formulation, execution, and review of policies, plans, and programs for historic preservation. This includes establishing objectives and approving performance (AR 420-40 1984:1-4).

1.4.2 The Chief of Engineers (COE)

The Chief of Engineers (COE) has primary staff responsibility for conducting and monitoring the Department of the Army's (DA) historic preservation program and for compliance with the NHPA and provisions of Federal laws and regulations listed in appendix B. The COE will--

1. Issue policy and furnish regulations and technical guidance to guarantee protection and proper treatment of historic properties.
2. Set standards for historic preservation programs, plans, and projects.
3. Obtain signature of the Army's Federal representative on applications for nomination of properties to the national Register of Historic Places (RCS DOI-1005) that have been sent through channels.
4. Keep a list of all Army-controlled properties listed on the National Register and publish it periodically.
5. Approve all Memorandums of Agreement (MOA) or other compliance documents requiring development of a historic preservation plan.
6. Keep a list of all MOA and ACHP comments.
7. Identify Army-wide historic preservation priorities for staffing and funding needed to develop and carry out historic preservation programs and plans.
8. Define qualifications for Army personnel and contractors engaged in Army historic preservation programs, plans, and projects.
9. Review the choice of non-Army laboratories, museums, archives, and other public buildings and institutions for long-term curation of historic and archeological materials.
10. Attend and organize conferences, programs, meetings, and staff visits to gather information and to provide policy guidance on historic preservation activities.
11. Provide information on the DA historic preservation program and Federal historic preservation laws and regulations to MACOMs and installations (AR 420-40 1984:1-4).

1.4.3 The Chief, National Guard Bureau

The Chief National Guard Bureau will--

1. Assist the State and Territory adjutants general (AG) (when the ARNG is a tenant) to cooperate with the host or support active component installation staff to conduct historic preservation activities on federally owned and/or controlled lands leased or licensed to the State or Territory Military Departments for Army National Guard (ARNG) use. This includes the

following ARNG facilities (referred to as installations in this regulation unless otherwise noted)–

- a. Training sites with permanent facilities.
 - b. Mobilization and Training Equipment Sites (MATES).
 - c. Unit Training and Equipment Sites (UTES).
 - d. Combined Support Maintenance Shop (CSMS).
 - e. Army Aviation Support Facility (AASF).
 - f. Army Aviation Flight Activity (AAFA)
 - g. Aviation Classification Repair Activity Depot (AVCRAD).
 - h. Organizational Maintenance Shop (OMS).
 - i. Armory.
2. Assist the AG to evaluate and protect significant historic properties on federally funded ARNG facilities and training sites according to the NHPA and applicable Federal laws and regulations listed in appendix B.
 3. Provide technical assistance to the AG, on request, for--
 - a. Preparing and carrying out an ARNG HPP.
 - b. Locating, inventorying, evaluating, and nominating federally funded ARNG properties meeting National Register criteria.
 - c. Reviewing the requirements for and the technical adequacy of ARNG HPP, projects, protection strategies, reports, National Environmental Protection Act (NEPA) compliance, National Register nominations, requests for Determinations of Eligibility, and MOA with the ACHP.
 - d. Maintaining a record of all ARNG federally funded or owned properties listed in the Federal Register.
 - e. Maintaining a record of all ARNG MOA and other compliance documents applicable to federally funded or owned ARNG properties.
 - f. Coordinating ARNG historic preservation and related plans through the ARNG Operating Activity Center (NGB-ARI-E), Aberdeen Proving Ground, MD 21010, with the Office Chief of Engineers, HQDA (DAEN-ZCF-B), as appropriate (AR 420-40 1984:1-4).

1.4.4 MACOM Commanders and State and Territory AGs

MACOM commanders and State and Territory AGs will assist their installations to locate, identify, evaluate, and protect significant historic properties. Each

MACOM commander and AG (via State Historic Preservation Officer (SHPO) or NGB-ARI-E) will provide technical assistance to installations, as requested, for--

1. Preparing and carrying out an HPP.
2. Locating, inventorying, evaluating, and nominating properties meeting National Register criteria.
3. Selecting and carrying out the proper treatment, such as maintenance, repair, adaptive use, or preservation of historic buildings, structures and districts. (See TM 5-801-1 and TM 5-801-2 for recommended procedures and techniques).
4. Choosing appropriate research designs, sampling methods, analytical techniques, and protection strategies for archaeological properties.
5. Documenting and categorizing historic buildings and structures.
6. Reviewing the requirements for and the technical adequacy of the installation HPPs, projects, reports environmental impact analyses. National Register nominations, requests for Determinations of Eligibility, and MOA with ACHP (AR 420-40 1984:1-4).

1.4.5 Installations Commanders and AGs

Installations commanders and AGs (referred to as installation commanders, except where noted) will--

1. Develop a historic preservation plan to locate, inventory, evaluate, and protect historic properties.
2. Provide qualified historic preservation expertise, facilities, and resources necessary to carry out the HPP, (in accordance with paragraphs 4-2, 4-3, 4-4, and 4-7).
3. Budget or program for resource requirements sufficient to carry out the HPP.
4. Afford the ACHP an opportunity to comment on the HPP and on any undertakings that may have an adverse effect on a historic property.
5. Consult or coordinate, as necessary, with the following on historic preservation activities, plans, and projects--
 - a) State Historic Preservation Officer (SHPO).
 - b) Other Federal, State and local agencies.
 - c) Local universities and colleges.
 - d) Federal, professional, and avocational organizations.
 - e) Museums.

- f) Interested persons.
- 6. See that the HPP and projects are coordinated with mater planning (AR 210-20 and NGR 415-5), environmental analysis (AR 200-2), and natural resources management plans and programs (AR 420-74).
- 7. Plan military training, construction, and undertakings to avoid or minimize adverse effects on historic properties.
- 8. Request, through command channels (AGs request through NGB-ARI-E), a Determination of Eligibility by the Secretary of the Interior (36 CFR 64) when the SHPO and the installation do not agree as to whether a property is eligible for listing on the National Register.
- 9. Nominate, through command channels (AGs nominate through NGB-ARI-E) to the National Register (in accordance with paragraph 1-5), all Army controlled properties that meet the criteria of the National Register (36 CFR 60).
- 10. Review Antiquities Permit applications and route them through command channels (AGs route through NGB-ARI-E) for processing.
- 11. Be sure that military police and other security personnel are trained to enforce
 - a) laws that protect historic and archaeological properties, including but not limited to the Archaeological Resources Protection Act of 1979 (ARPA).
 - b) measures to be taken to reduce and eliminate illegal activities affecting such properties, per AR 190-31.
 - c) procedures for prosecuting violators (AR 420-40 1984:1-4).

1.4.6 Installation Director of Engineering and Housing

Installation Directors of Engineering and Housing, AGs, or other installation activity responsible for management of the historic preservation program (referred to as DEH, except where noted) will--

- 1. Develop and manage the HPP and all related staff activities and projects.
- 2. Provide the historic preservation staff with training, attendance at professional meetings, and other opportunities that assure that the HPP and related projects incorporate current methods, techniques, and information.
- 3. Coordinate HPP projects with Federal, State and local government and private preservation agencies, as appropriate.
- 4. Monitor all archaeological field investigations (AR 420-40 1984:1-4).

1.4.7 Installation Historic Preservation Officer

The Commander of Kahuku Training Area, or order to meet the responsibility for historic preservation compliance will designate an Installation Historic Preservation Officer (IHPO) who will be responsible for overseeing all cultural resources management actions for KTA. Major duties and responsibilities of the IHPO are as follows:

1. historic preservation law training for IHPO, plus law enforcement (ARPA) and cultural resources sensitivity training for KTA military law enforcement and other staff who regularly conduct field inspections or reconnaissance,
2. coordinating NHPA Section 106 compliance procedures,
3. managing and periodically updating a cultural resources database,
4. coordinating with other military personnel to ensure that historic preservation compliance objectives do not conflict with and are integrated into other land-use and resources management documents and programs, including the Master Plan, Ecosystems Management Plan, Fire Management Plan, Installation Restoration Program, NEPA documents, and the like,
5. monitoring archaeological site conditions and coordinating site protection activities;
6. scheduling site inventory, assessment, and treatment studies per the Training Area risk assessment, including development of scopes of work, contracts management, and/or supervision of in-house qualified archaeologists,
7. reviewing permit applications and monitoring work performance to ensure compliance with terms of Cultural Resources Use Permits issued by the U.S. Army Garrison, Hawaii for non-Army sponsored archaeological research projects,
8. assuring that regular ARPA/NAGPRA notification is provided to military and non-military users and visitors,
9. establishing the Historic Preservation Awareness Program to promote appreciation of the need to preserve the installations archaeological resources, including distribution of technical reports to interest professionals,
10. coordinating with Native Hawaiians, implementing burial protection measures, and completing NAGPRA inventory, consultation and repatriation requirements,
11. preparing the annual Historic Preservation Compliance Report to the State Historic Preservation Division and the Advisory Council on Historic Preservation, and
12. updating the Historic Preservation Plan every four years, or as appropriate [Eidsness et al. 1995:57]

[Redacted text block]

2.1.5 Topography

[Redacted text block]

2.1.6 Geology

[Redacted text block]

2.1.7 Soils

There are three major soils associations within KTA: [Redacted text block]



2.2 PREHISTORIC AND HISTORIC OVERVIEW

This information is presented to acquaint the user groups of KTA with the history of the area. This background information provides context for understanding the traditional and historic use of the area, and for assessing and evaluating historic properties at KTA.

2.2.1 Traditional Land Use and Settlement Patterns for Kahuku Training Area

The history of human occupation in the Hawaiian archipelago commenced around the sixth century A.D., and possibly earlier, with the arrival of Polynesians who had sailed northward, probably from the Marquesas Islands (Kirch 1985:1). Settlement was initially on the coasts; over time, as population and resource requirements increased, coastal population centers became more numerous, with an increase in the exploitation of outlying and more marginal areas, which the KTA area may have represented. Eventually, exploitation and population grew in the more resource-abundant areas, and expansion and settlement of inland and leeward areas intensified (e.g., Kirch 1985:298-306). The settlement pattern model presented by Kirch (1985:302-306), the Expansion Period began ca. A.D. 1100, with even the least exploitable zones settled before A.D. 1650.

Owing to the somewhat drier climate of the northern Ko`olau Loa area, it is possible that this area was permanently settled somewhat later than areas to the south. Given the abundant resources in the area, however, including permanent streams, wetlands, springs, and forested valley interiors, it is also possible that the area was settled relatively early. Regardless, it is reasonable to assume that the northern Ko`olau Loa area would have been exploited for the plant and animal resources available there both prior to and following the advent of permanent occupation. Also, the relatively level coastal lands formed a convenient route between the population centers of the Waialua District and the southern Ko`olau Loa and Ko`olau Poko Districts, part of a trail that circled the island (Γi 1983:98).

As population expansion and settlement throughout the islands occurred, complex trail systems and transportation networks developed. These trails probably initially developed along the coasts

between coastal settlements; later, trails crossed entire islands, connecting coastal and inland settlements for purposes of communication and transportation of goods for exchange and subsistence.

Among the best available sources for information regarding traditional Hawaiian lifeways is the ethnographic research of Handy (1940) and Handy and Handy (1972), who investigated traditional subsistence strategies and areas of cultivation and habitation. Their descriptions of Hawaiian communities have proven useful in the development of settlement models for particular localities, including the northern Ko`olau Loa area.

The typical homestead or *kauhale*...consisted of the sleeping or common house, the men's house, women's eating house, and storehouse, and generally stood in relative isolation in dispersed communities. It was only when topography or the physical character of an area required close proximity of homes that villages existed. There was no term for village. *Kauhale* meant homestead, and when there were a number of *kauhale* close together the same term was used. The old Hawaiians, in other words, had no conception of village or town as a corporate social entity. The terrain and the subsistence economy naturally created the dispersed community of scattered homesteads. Water supply was, however, a consideration which frequently led to grouping of homesteads close together. . . . Where conglomerations of homesteads existed, they were not communities held together either by bonds of kinship or economic interdependence. The grouping was fortuitous, and the ties of relationship of each household reached out to relatives living in other parts of the same or neighboring *ahupua`a*. [Handy and Handy 1972:284-285]

In general, then, *kauhale* were scattered over plains and broad slopes, unless water was a limiting factor; this was probably not the case for the majority of Kahuku Training Area.

This information is supplemented by Handy and Handy (1991) discussing various aspects of settlement and land use. According to Handy and Handy (1991), development of land was probably closely tied to areas with good fishing grounds:

One factor of prime importance affecting the development of [traditional Hawaiian] plantation areas was propinquity to good fishing grounds. Such land areas as were intensively developed were always in localities where good fishing grounds were easily accessible. It may be said therefore that as a general principle Hawaiians developed their land resources only where they lay not too far distant from good fishing grounds which would give them their needed protein food. Hogs and dogs were luxuries enjoyed by the *ali`i*, rarely by country folk. . . . On Kauai and Oahu sweet potatoes were planted only as a supplement to taro, along the coastal zone where there was sandy or rather dry soil not suitable for taro. Yet there were very extensive areas which, it would seem, might have been utilized for sweet potatoes if there had been sufficient pressure of population to demand it. . . .

Yet in old Hawaiian times this land was undeveloped (Handy and Handy 1991:282-283).

Handy and Handy (1991) also provide descriptions of the land use of each of the *ahupua`a* that Kahuku Training Area sits upon. These descriptions are as follows:

2.2.1.1 Kahuku

Handy and Handy discuss how there are conflicting descriptions regarding the land use of Kahuku in early days. According to Handy and Handy, there seems to be no evidence today of taro terraces along Kahuku Stream, although informants indicated that taro was cultivated in the area in early days. Early historic descriptions also present contradictions in this matter. In 1784 Cook wrote the following about the area around Kahuku: "Nothing can exceed the verdure of the hills, the variety of wood and lawn, and the rich cultivated valleys which the whole face of the country displayed (Cook as cited in Handy and Handy 1991:462). However, only thirteen years later Vancouver stated: "Our examination confirmed the remark of Capt. King excepting that in point of cultivation or fertility, the country did not appear in so flourishing a state..."(Vancouver, as cited in Handy and Handy 1991:462). And in 1833 Kahuku was described by Hall in the following manner: "much taro land now lies waste because the diminished population of the district does not require its cultivation." (Hall, as cited in Handy and Handy 1991:462). It would seem from these descriptions, that Kahuku was once highly cultivated, but that sharp declines in population in the early historic period resulted in the waste and abandonment of the area.

2.2.1.2 Hanako`ae

According to Handy and Handy, the *ahupua`a* of Hanako`ae did not have "sufficient flatlands for taro cultivation under the old system" (Handy and Handy 1991:462).

2.2.1.3 Kiapapa`u

Handy and Handy (1972) offer this description of Kaipapa`u Ahupua`a.

In Kaipapa`u (Shallow-sea) the *ahupua`a* adjacent to Hau`uifa, the upper stream valley is steep and narrow, yet natives of the district say that, making the most of small opportunity, a few *lo`i* used to be worked there. The level land to seaward may once have supported a moderate amount of terracing, but as this was all under cane when the area was studied in 1953, the extent could not be determined (Handy and Handy 1991:460).

2.2.1.4 Lā`ie

According to Handy and Handy, Lā`ie was an area of intense taro cultivation:

The comparatively flat land between the rough hills and the bay (which is famous as a fishing area and for catching sea turtles even today) was anciently divided into numerous named districts and was thoroughly cultivated. In 1935 Kekuku, a 75-year-old *kama`aina* of the place, pointed out an area more than 60 acres in extent as having formerly been the largest single wet-taro area in La`ie *ahupua`a*, on land owned by his family for generations. It lies back of the present Mormon Temple, and was watered by springs, hence known as Ka-puna (The-spring).

Up Koloa (Wild-duck) Stream, which is toward Hau`ula from La`ie Stream, there are many groups of stone-faced terraces, formerly taro *lo`i*, now overrun with the spreading roots of great mango and breadfruit trees which marked old homesites along this twisting, rocky, and very beautiful watercourse. Other stream valleys show more scattered remains. We have the names of several large taro terraces that were famous anciently and have survived only in memory, such as Naue-loli (Move-[and]-change), Kuamo`o (Backbone), Mahanu (Rest-[and]-breathe), Makali`i (Pleiades), Po`o-haili (Head-recalls) (Handy and Handy 1991:461).

Handy and Handy note, however, that La`ie was an area subject to drought (Handy and Handy 1991:275).

2.2.1.5 Malaekahana

According to Handy and Handy, there were once some irrigated terraces in Malaekahana but do not elaborate further (Handy and Handy 1991:462).

2.2.1.6 `Ōpana

Handy and Handy (1991) indicate that `Ōpana maintained "a small spring-watered terrace area named Ka-wela (The heat), which is also the name of the bay below" (Handy and Handy 1991:462-463).

2.2.1.7 Waiale`e

According to Handy and Handy, Waiale`e was the location of a small group of irrigated terraces anciently known as Kane-ali`i (Handy and Handy 1991:463).

2.2.1.8 Paumalū and Pupukea

Handy and Handy (1991) suggest that Paumalū and Pupukea *Ahupua`a* were not cultivated in ancient times:

Two other *ahupua`a* situated between Kaunala and Waimea, namely Paumalu and Pupukea, are not of a topography to support wet-taro culture of the ancient type. High-level uplands are now given over to pineapple. The narrow seaward plain had no water. According *kama`aina* informants, the gulches or streams in these two localities never were terraced or planted (Handy and Handy 1991:463).

2.2.1.9 Kaunala, Keana, Pahipahi`alua

According to Handy and Handy, the *ahupua`a* of Kaunala, Keana, and Pahipahi`alua did not have "sufficient flatlands for taro cultivation under the old system" (Handy and Handy 1991:462).

By the A.D. 1600s, the Hawaiian sociopolitical system had evolved to an early State level. High chiefs (*ali`i nu`i*, or *mo`i*) were in control of individual islands (*moku*), or one or more districts on an island; lesser chiefs (*konohiki*) supervised *ahupua`a*. These *ahupua`a* were further broken down into parcels held by use-right by commoners (*maka`ainana*). Land divisions were assigned within *ahupua`a*. At least nine smaller divisions were recognized, the most common being *ili* (small divisions often used by extended families) and *kuleana*. Distribution of goods and services was controlled by the *ali`i nui*, with responsibilities of supervision delegated to the lesser chiefs, who further delegated responsibilities down the sociopolitical ladder.

This hierarchy was maintained by a religious system in which the high chiefs possessed great spiritual power (*mana*). The maintenance and garnering of *mana* was ever-present throughout the culture (Sahlins 1981). All aspects of traditional Hawaiian lifeways were affected by religion, and were accompanied by sacred rituals and ceremonies in place to assure the approval of the gods in each undertaking. Maintaining this spiritual power was a hierarchy of priests (*kahuna*), paralleling the sociopolitical hierarchy and supporting it. The *kapu* (proscription) system ensured social order; to disobey the *ali`i*, *kahuna*, or their delegates, or transgress against the gods or the practice of religion, was forbidden, or *kapu*.

Physical evidence of the value and role of religion within Hawaiian culture is exhibited in widespread archaeological sites and features. Stokes (Stokes and Dye 1991:24-25) identified nine principal classifications of *heiau* during his 1906-1907 research on Hawai`i Island:

According to information gathered in the field from modern natives, there were the following places of worship. Temples for human sacrifice were sometimes termed *po`o kanaka* but were generally described. The ancient term *luakini* now serves to designate the modern church and was not known to any native I met as the designation of a former temple.

I came across many foundations of temples with the name Hale o Lono, and when information was available, it was to the effect that temple was not for human sacrifice. Occasionally temples were found ascribed to the great gods Kane and Kanaaloa, to the lesser gods Pele and Hi`iaka of the volcano family, and to the shark gods.

A list of terms collected in the field includes:

1. *Heiau ho`omana*: temples of the priestly class.
2. *Heiau ho`ouluulu ua*: temples to induce rain.
3. *Heiau ho`ouluulu ai*: temples to cause good crops. Inquiry generally showed, however, that this and the preceding were for the same purpose. One of this form was termed *ko`a ho`ouluuluai*.
4. *Ko`a, heiau ku`ula, heiau ko`a, heiau ho`oulu i`a* and similar combinations: temples to secure good catches of fish.
5. *Heiau hana aloha*: temples to impel love.
6. Shrine for aid in childbirth.
7. *Pohaku o Kane*: a shrine.

Stokes went on to mention that there were many categories of lesser shrines, for smaller groups, families, and individuals, dedicated to various gods, *akua*, or *aumakua* (Stokes and Dye 1991:21-39). Within individual or extended-family habitation complexes, family shrines and alters were integral components of the structure and setting of the site (Kirch 1985). Shrines (*ko`a*) and temples (*heiau*) are found in association to fishing villages and prominent headlands along the coast, and are indicative of the role of religion in the maritime economy (Barrera 1971; Kirch 1979). A discussion of *heiau* types is important to the present undertaking, as several sacred or potentially sacred sites have been recorded in and around Kahuku Training Area (see Section 3.0).

By the time of the arrival of Captain James Cook in A.D. 1778, the Hawaiian culture was highly ordered under the sociopolitical and religious structures of the *kapu* system. All aspects of Hawaiian lifeways were affected by this system. Production and distribution of goods and services were under the control of the reigning *ali`i*, with subordinate, hierarchical, authority delegated through their affines and the priestly class of *kahuna*, downward to the commoner. The commoners were the labor force, overseen by *konoiki*, who administered the will of the *ali`i*.

The commoners, tied to the land as they were, would have been limited in the extent of their exploitation range. It has been postulated their range was, for the most part, confined to their home and neighboring *ahupua`a* within the resident district (Handy 1940; Kirch 1985). Yet the extensiveness of the trail systems suggests the commoners' ability to travel was not so greatly restricted, and this is somewhat supported by native accounts of travels to various localities throughout each island, and between islands. An example of this is the tale of the famous *kapa*

beater lost in Kahuku and found by its owner in Waipahu, `Ewa (McAllister 1933:106; Sterling and Summers 1978:25-26, 149).

2.2.2 Legendary History

The antiquity of the Ko`olau Loa District is reflected in the preserved legends and oral history of the area. An examination of these oral traditions are presented here to indicate the traditional uses and antiquity of the region. The legends of the more prominent *ahupua`a* that comprise Kahuku Training Area reflect the importance of both coastal and upland resources located there.

2.2.2.1 Kahuku Ahupua`a

Kahuku, which literally means "the projection," (Pukui et al., 1986:66) is remembered in a traditional proverb in the following manner:

Kahuku `aina lewa. Kahuku, an unstable land. O`ahu, according to legend, was once two islands that grew together. Kahuku is the part that bridges the gap (Pukui 1983:144).

This proverb is explained in one of the earliest recorded Hawaiian legends. Levi Chamberlain, a missionary accountant, recorded the following legend in an 1828 report. The tradition, as recorded by Chamberlain, describes the creation of Kahuku.

The natives tell a marvelous story respecting the origin of this district which they say floated in from the sea, and attached itself to the ancient shore of the island, that there was a subterranean communication between the sea & the ancient shore, by which a shark used to pass, & make depredations up on land. The basis of the tract, which is 5-7 miles in length, & from 1 to 2 miles in breadth, appears to be of coral; and it was evidently redeemed from the sea... [Chamberlain 1957:35-36]

Several variations of Chamberlain's translation of the tradition exist. A popular version is that the floating island of Kahuku banged against the island of O`ahu, creating so much noise that:

...the old women guarding Princess Laieikawai...grappled the island with fishhooks and attached it securely to Oahu. Polou Pool on the sea side of the Kahuku Mill is one spot where the hook was fastened. The other end was fastened at Kukio Pond, 300 feet inland at Kahuku Point. [Boswell 1958:68]

Another version of the legend about the formation of Kahuku maintains that Kahuku was once a separate island that was inhabited by Menehune. According to legend, Kahuku floated and was once situated a distance out to sea. The only problem with the island is that it did not have a natural source of fresh water. Because of this, the menehune were forced to paddle their island into the bays of O`ahu every night in order to collect water. One day, a man from Kahuku suggested

that everyone make hooks of whalebone and attach them to Olona ropes to capture the island. The people were successful in capturing the island as the Menehune were unable to free it from the whalebone hooks and the Olona ropes (Paki 1972:53).

Another proverb about Kahuku Ahupua`a describes the early environment of Kahuku, indicating that hala trees (pandanus) were abundant in the area:

Nani I ka hala ka `ōiwi o Kahuku. The body of Kahuku is beautified by hala trees. Refers to Kahuku, O`ahu (Pukui 1983:248).

The fact that Kahuku was known for its abundant hala trees is also a theme in many traditional legends of the *ahupua`a*.

In the Story of the Formation of these Islands and Origin of this Race, Fomander records a prayer of Kualii, who describes Kahuku as a pandanus (Fomander 1917:28).

Hala trees also play a major role in the legend of Kalelealuaka. According to this legend, Kalelealuaka was a strong, brave youth who disguised himself and fought many victorious battles for King Kakuhihewa against the forces of Kualii. Before one of these battles Kalelealuaka rushed to Kahuku and decorated himself with wreaths of pandanus fruit and flowers of sugarcane from Kahuku. Disguised this way, he came upon the lame Marshall of the King and offered to carry him to the battle. The Marshall asked Kalelealuaka where he was from and he answered Kahuku. Since Kalelealuaka was decorated with foliage from the Kahuku, the Marshall believed him and gave him the district of Koolau in reward for his service (Thrum 1976:100).

Another proverb about Kahuku also illustrates environmental conditions, this time referring to an underground stream:

Pukana wai o Kahuku. The water outlet of Kahuku. Refers to the outlet of an underground stream that once flowed from Kahuku to Waipahu, O`ahu (Pukui 1983:299).

This underground stream is the focus of another traditional legend of Kahuku, the story of the song of the kapa log. According to this legend a woman from Kahuku lost her kapa log in a stream one day. She had used the same kapa log for many years and was so fond of it that she referred to it as her grandchild. Thinking that the underground spring had to carry the log to some final destination, she set out to look for it. After several days, she heard its familiar ring up in a valley in Waipahu. The underground spring had carried her "grandchild" the entire distance to Waipahu (Pukui 1976:162-167).

Other legends of Kahuku provide insight into the traditional land use and activities of the *ahupua`a* including subsistence activities of fishing, and sociopolitical activities such as warfare and the *kapu* system.

The importance of fish and fishing activities in Kahuku is apparent in the following two legends. Kahuku is mentioned by Thrum in the legend of Kaneaukai. According to this legend, schools of the *anae-holo* and *kala* travel to Waimea from Maui, by way of Kahuku during the periods from April to July (Thrum 1976:254). Obviously, knowledge of fish migrations would be of utmost importance to a society that is dependent on marine resources.

The following legend not only emphasizes fishing as a subsistence strategy in Kahuku, but also deals with the sociopolitical aspects of warfare, and an apparent *kapu* placed on the eating of *hilu* (reef fish). Two fish from Tahiti is a legend where two canoes full of people (referred to as "fish") set sail for Hawai`i. Upon reaching O`ahu, the two boats went in separate directions one sailing north and the other sailing south in search of a good place to settle. One boat landed at Hauula where a battle took place between the men from Tahiti and the fishermen of Hauula. The fishermen were victorious, and the "fish" (men) from Tahiti were killed and eaten. The other boat of Tahitians continued to sail about the island. They became worried about their companions when they did not meet up, and landed at Kahuku to try to determine their whereabouts. The people of Kahuku were friendly and invited their new friends to feast with them. They explained to the Tahitians that a large battle had with a great fish had taken place at Hauula, and the fish had been divided up amongst all the people in the area. The Tahitians recognized that the feast was actually comprised of their companions, so they took portions of the flesh and threw it into the ocean, where it came to life as red *hilu*. The fish then swam to Hauula and dammed up the waters above the valley creating a great flood and taking vengeance upon the cannibals (Westervelt 1991:142-144).

Warfare in Kahuku is also the underlying theme of the Legend of Kamapua`a, a man of supernatural powers who could take either the form of a man or a hog. Kamapua`a, who was born in Ko`olau Loa, altered the land and created many of the landmarks and features on O`ahu through his mischievous deeds. According to one, legend Kamapua`a was fond of stealing the chickens of Olopana the king of O`ahu at the time. When Olopana found out that it was Kamapua`a who was responsible for the loss of his chickens he sent armies of men out to capture him. Every army that Olopana sent out against Kamapua`a was completely defeated including the men of Kahuku (Elbert 1982:200).

2.2.2.2 Kaipapa`u

Kaipapa`u which literally means "shallow sea" (Pukui et al., 1986:70) like that of Kahuku, also maintains proverbs and legends which describe the early environment and traditional activities of the area. One of the proverbs about Kaipapa`u illustrates once again the importance of fish migrations.

Ka i`a hali a ka makani. The fish fetched by the wind. The `anaeholo, a fish that travels from Honouliuli, where it breeds, to Kaipapa`u on the windward side of O`ahu. It then turns about and returns to its original home. It is driven closer to shore when the wind is strong (Pukui 1983:145).

Another proverb about Kaipapa`u plays on the literal meaning of Kaipapa`u, which describes the early environment of the area.

No Kaipapa`u, paha? From Kaipapa`u, perhaps? A play on the name Kaipapa`u (Shallow-sea). He must be from Kaipapa`u, for he appears to be shallow-minded (Pukui 1983:254).

Kiapapa`u is recorded in legend as being the home of an old kahuna who worshipped the gods Kane and Kanaloa. The gods lived at Kiapapa`u where the old man constantly worshipped them but they traveled often. On one occasion the gods visited their sister who gave them dried fish. They threw the fish into the ocean where they became alive again and followed the gods along their journey. When the gods reached the river at Kiapapa`u they turned inland so the fish swam up the river to a pool where the gods had stopped. It is said, that whenever high waters make it possible the ulua come up the river to the place where the kahuna worshipped Kane and Kanaloa (Westervelt 1991:145).

2.2.2.3 Lā`ie and Malaekahana

Lā`ie which literally means `ie leaf (Pukui et al., 1986:128) is best known for its legends and proverbs about the beautiful princess Lā`iekawai. One traditional proverb has the following to say about Lā`ie:

Lā`ie I ka `ēheu o na manu. Lā`ie, borne on the wings of birds. Lā`ie is a gathering place for people. Twin girls were born at a place now bearing the name of Lā`ie, O`ahu. The older twin, Lā`iekawai, was reared by her grandmother, Waka, and was said to rest on the wings of birds. The younger Lā`ielohelohe, was taken by a kahuna to rear (Pukui 1983:209).

According to legend, Lā`iekawai and Lā`ielohelohe were the twin daughters of Malaekahana and Kahauokapaka who was chief of both Koolau districts. Kahauokapaka desired a son, so he made a

vow that any girl children bore to him by his wife Malaekahana would be put to death. Kahaukapaka made good on his vow, killing four daughters in a row. When Malaekahana was pregnant for the fifth time, she sent her husband away to gather some fish for her. In his absence she delivered the beautiful twin girls. Not wanting to see her daughters die like the others, Malaekahana sent La`iekawai to live with her grandmother Waka, and La`ielohelohe to be reared by a kahuna named Kapukaihaoa. When her husband returned, Malaekahana informed him that she had given birth, but that the child was born without life. Waka protected La`iekawai by taking her to live in a cavern that could only be entered by diving into the pool of Waiapuka (Kalākaua 1990:457).

The pool of Waiapuka, and the secret cavern said to protect La`iekawai from death was visited up until the early 1900s when it was said to have silted up, restricting entrance. The pool was visited and described by none other than King Kalākaua. His description of this event is interesting, as it connects traditional lore with actual physical manifestations in the environment. His description is as follows:

Early in the spring of 1885 a party of six or eight ladies and gentlemen--the writer being of the number--made a carriage circuit of the island of Oahu...Entering the district of Koolauloa the next day, and approaching the coast over a broad stretch of grassy meadow but slightly above the level of the ocean, our party was suddenly brought to a halt beside a pool of clear water, nearly round, and perhaps a hundred feet in diameter. The surface of the pool was ten or twelve feet below the level of the surrounding plain, and its even banks of solid rock dropped almost perpendicularly into water of unknown depth. The volume of the pool is affected neither by rain nor drought, and the native belief is that it is fed by springs at the bottom, and has a subterranean drainage to the ocean, some two or three miles distant.

This, we learned, was the celebrated pond of Waiapuka, around which so many strange legends have been woven. All of them speak of a cavern somewhere beyond the walls of the pool, and to be reached only by diving into the water and finding the narrow passage leading up into it.

While listening to fragments of the story of Laieikawai and of other legends connected with the mysterious cavern, and seriously doubting the existence of the secret chamber so prominently referred to in the early folk-lore of Oahu, an old native, who had joined the party at Kaneohe, quietly and without a word dismounted, divested himself of his upper garments and plunged into the pool. Swimming to the northern wall, he clung for a moment to a slight projection, and then disappeared. It was suggested for the first time that he was in search of the cavern of Laieikawai, and all eyes were turned toward the point where he was last seen above the water.

Three or four minutes elapsed, and fears for his safety began to be exchanged, when the salutation of "aloha!" greeted us from the opposite wall, and the next moment a pair of black eyes were seen glistening through a small opening into the cavern, not before observed...we were compelled to admit that the cavern of Laieikawai was a reality, however wild and visionary may have been the stories connected with it (Kalākaua 1990:455-456.)

Another legend surrounds the beautiful twin princesses. It was said that Laiekawai, was the element of water and dwelt in the sacred pools, and Laielohelohe, was the element of air and took the form of a beautiful dragon fly. Their grandmother often appeared in the form of a rainbow, and protected them from the air, and their grandfather Pubi, the eel-god protected them from the water. One day a great ali'i from Kaua'i, Hulumaniani was traveling about O'ahu and saw the rainbow of the twins and went to investigate. He took the form of the Koa'e bird and appeared to the twins inviting them to go for a flight with him. Laiekawai agreed, while Laielohelohe stayed behind. After a time Laiekawai discovered that she was far from home and called to her relatives for help, who enveloped her into the rainbow (Paki 1972:52).

Like other areas in Ko'olau Loa, Lā'ie also has legends indicating the importance of fishing as a subsistence strategy. One such legend is the legend of Maikohoa.

Maikohoa was a fearless man who angered his father by breaking the *kapu* staves at a sacred place of worship. Because of this, he was banished by his father and traveled to Maui where he turned into the *wauke* plant. His sisters went in search of him and during their journey settled in various places around O'ahu bringing certain fish from their home to the new places. One sister, Kahukuuna, settled in Lā'ie after marrying Laniloa. The fish that came with her were the mullet which remain there today (Fomander 1919:270, Laieikawai 1919:354).

The annual journey of mullet from 'Ewa to Waikīki, around the end of O'ahu and ending in Lā'ie is explained in another legend. According to the story, a woman from 'Ewa married and built a home with her new husband at Lā'ie. They lived in comfort there, with banana and taro patches, sugar cane and sweet potatoes, and shellfish and seaweed which they collected from the reef. There was only one thing missing; fish. One day the wife asked her husband to go to 'Ewa where she had grown up and bring back fish. The husband questioned her. Fresh fish would spoil during the trip and dried fish would be too heavy to carry all that distance. The wife responded "bring fish in the sea," and told her husband to go ask her father who had power from the gods to "give him fish in the sea." The husband did not understand her strange request, but followed her instructions nevertheless. Upon hearing his son-in-law's request, the father prayed to his gods, and

then nothing else was said about the fish. When the husband was ready to return to La`ie, the father said, "you shall take fish in the sea." The husband did not understand this, but went on his way. He traveled to Nu`uanu, where the people were fishing because there was a run of mullet. He wished that there were fish at his home in La`ie. When he got to Waikīkī he saw people fishing and feasting on a run of mullet and again he wished that there were fish in La`ie. Finally, he reached home and discovered the next morning that the sea was full of mullet. They had followed him, in the sea, on his journey home (Pukui 1988:48-51, Thrum 1976:269-272). This particular legend also illustrates the importance of cultivation in addition to fishing in the Ko`olau Loa District.

Finally, the physical topography surrounding the area of La`ie and Malaekahana is explained in legend. The small islets which are present near La`ie, at Malaekahana Bay were formed according to legend from the pieces of the chopped up head of a giant *mo`o* (a great lizard). The monstrous *mo`o* killed all people who passed within its reach. According to legend, Kana from the island of Hawai`i got a band of men together and they systematically killed all the *mo`o* that they could find in the islands. One of the *mo`o* that they killed was at La`ie where they chopped the head of the monster into five pieces and threw them into the ocean. The five pieces of the *mo`o* turned into the islets Maluawai, Keauakahepaaa, Pulemoku, Mokuaaniwa, and Kihewamoku (Armitage 1944:141).

2.2.3 The Early Post-Contact Period: A.D. 1778-1845

Following the explorations of Captain James Cook in 1778, European references to the Ko`olau Loa District appear in journals of early explorers. Equally brief and intermittent written records during the early post-Contact period are mentioned in the letters, reports, and journals of the missionaries who arrived in the Sandwich Islands in 1820, and in the published narratives of their native students. The majority of the early post-Contact period records of native land use and settlement patterns in Ko`olau Loa were found in the missionary letters and journals of Rev. John and Ursula Emerson assigned to the Ko`olau Loa-Waialua District mission in 1832.

The development of Hawaiian culture, and the history of traditional Hawaiian lifeways, was altered with the arrival of Captain Cook, followed shortly by other Westerners. Most changes were not immediately pervasive. Outlying areas, furthest from Western influence (possibly including the northern Ko`olau Loa area) would have been less affected by Western culture for some years afterward, until inland products such as sandalwood began to dominate foreign trade.

During the early nineteenth century, population declined rapidly throughout the Hawaiian Islands due to inter-island warfare and introduced diseases (Kelly 1991; Stannard 1989). Kelly (1991) references several accounts that detail the decimation of the population of the `Ewa District, south of the current project area. When Kahekili conquered O`ahu in 1783, "he is said to have been responsible for killing whole populations of villages in `Ewa" (Kamakau 1961:137, cited in Kelly 1991:157). Later, "when Kamehameha I came to [conquered] Oahu in 1795 the results were also devastating" (Kelly 1991:157). How often warfare-related deaths of non-combatants occurred before Contact is undetermined, but such actions could have affected population growth and settlement expansion.

Introduced diseases, including cholera, smallpox, bubonic plague, measles, and typhoid, as well as venereal diseases such as syphilis and gonorrhea, decimated the native population to an even greater degree as they had no natural resistance to these new illnesses. Epidemics destroyed whole populations of villages and districts, resulting in a decrease in population and equivalent shifts in lifeways and land use.

The rapid decline of population within the early post-Contact period precipitated the loss of a great resource: the oral histories and traditions of the residents of the island of O`ahu. Whole villages and groups of O`ahu residents died before early foreign arrivals had an opportunity to record their histories. The loss of this resource has made it difficult for modern researchers to effectively interpret traditional Hawaiian lifeways, settlement patterns, and land use. An influx of residents from Mau`i and Hawai`i followed the conquests of Kahekili and Kamehameha I, further compounding the problem as these individuals brought their own oral histories and traditions with them. Consequently, the extent to which these transported histories and traditions were altered to adapt to the new home on O`ahu is uncertain.

Nakamura (1981) and Silva (1984) summarize the known historical documentation of the Kahuku area in conjunction with archaeological surveys undertaken by Davis (1981), Bath (1984), Rosendahl (1985) and Walker et al. (1986). Nakamura and Silva agree there is little substantive historical documentation on the area. Both cite early mariners' descriptions of the Kahuku area that were previously reported by McAllister (1933). Subsequent studies (Stride, Craddock, and Hammatt 1993; Walker, Haun, and Rosendahl 1988) have not contributed additional historical information, but rather cite briefly the works of Nakamura and Silva.

The earliest description of the area was recorded 28 February 1779, in the log of Captain Charles Clerke, who had succeeded to command of the *H.M.S. Resolution* following the death of Captain Cook.

Run round the Noem [northern] Extreme of the Isle [O`ahu] which terminates in a low Point rather projecting [Kahuku Point]; off it lay a ledge of rocks extending a full Mile into the Sea, many of them above the surface of the Water; the country in this neighborhood is exceeding fine and fertile; here is a large Village, in the midst of it run up a large Pyramid doubtlessly part of a Morai. [Captain Charles Clerk's narrative cited in Beaglehole 1967:572, and recited by Nakamura 1981:1]

Lieutenant James King, also on board the *H.M.S. Resolution* at the time, made a similar entry about the windward side of O`ahu in general:

It (Oahu) is by far the finest island of the whole group. Nothing can exceed the verdure of the hills, the variety of wood and lawn, and the rich cultivated valleys, which the whole face of the country displayed. [McAllister 1933:153]

In contrast, Captain George Vancouver noted differences in the landscape 15 years later in 1794:

In every other respect our examination confirmed the remarks of Captain King; excepting, that in point of cultivation or fertility the country did not appear in so flourishing a state, nor to be so numerously inhabited, as he represented it to have been at that time, occasioned most probably by the constant hostilities that had existed since that period. [Vancouver 1798, Vol 3:71 cited in Nakamura 1981:2]

The possible decimation of the population and abandonment of the fields may have been due to multiple causes, such as warfare or epidemics, or may be related to seasonality. Clerke and King arrived during the wet season; Vancouver visited at the height of the dry season. Regardless of the cause, the population decline adversely affected the amount of land under cultivation. McAllister (1933:153) cites E.O. Hall's 1838 summary of conditions in the area: "Much taro land lies waste, because the diminished population of the district does not require its cultivation."

John Papa `Ti (1800-1870), a high chief and Hawaiian government official, visited relatives and friends living in *Waiale`e Ahupua`a* in about 1810, and provided a description of the area:

...a delightful land, well provisioned. There was a pond there, surrounded by taro patches, and there was good fishing places inside the reef...Chiefs and commoners crowded together at Puehuehue to go diving, or board surfing at Ulakua, just *makai* [towards the sea] of Kohalaloa, where the waves rolled and broke perfectly. [Ti 1983:24, 63]

Taro ponds along the beaches and shorelines were also used as holding ponds for mullet (Wilcox 1975:2), a fish generally reserved for the royalty. *Kapu* fish and fishing rights, until the division of Hawaiian lands in the 1840s, belonged to the King and were in charge of the chiefs (*konoiki*) of each *ahupua`a*. In Ko`olau Loa, *he`e* (octopus; *Polypus* sp.) was owned by and *kapu* for the king (Department of the Interior, Documents: 10:1852). Other fish and fishing rights were controlled by the chief, or headman of each *ahupua`a*, and were delegated to the commoners for harvesting.

Among other hardships the *konoikis* [sic] made exorbitant charges for fishing rights along the shore; certain fish were *tabu* and half the catch of other fish had to be shared with the chief. [Emerson 1928:138]

Following the division of lands after 1845, fishing rights were sold or leased by the owner of the *ahupua`a*.

In September of 1815, John B. Whitman made a visit to Pahipahi`ālua *Ahupua`a* with a friend to survey a plantation that had been granted by the high priest (Hewahewa) of Hawai`i Island. Whitman wrote in his journal that the point of Pahipahi`ālua *Ahupua`a* contained a hog pen (in addition to dogs and fleas) and was rocky and uncultivated; however, the "small valley" (Pahipahi`ālua Gulch) back from the point was stocked with taro. Preparations for collection of the king's taxes from Pahipahi`ālua, due at the time of the *makahiki* festival beginning in October, were being made at the time of Whitman's visit. The *konoiki* of Pahipahi`ālua enumerated salted fish, hogs, *tapa*, "5 pows" (*pa`u*; skirts worn by women), and "10 maros" (*malo*; men's loincloths) among the taxes being collected (Whitman 1979:78-82).

The Protestant missionaries sent to the Sandwich Islands by the American Board of Foreign Missions found the people of Hawai`i:

...dominated by the will of an autocratic and sometimes capricious chief or chief's headman...They had no incentive to improve their condition...and there were no laws to protect property and safeguard private ownership. A common man had to work for his chief whenever called upon; if he refused, he could be turned out of his home and whatever he had could be confiscated, his only recourse being to take French leave and... put himself under the rule of another chief. [Emerson 1928:137]

A heavy tax on the labor of natives of Ko`olau Loa (and other districts of Hawai`i) was the collection of sandalwood from the forests to pay for foreign sailing vessels purchased in trade by King Kamehameha I, and the high chiefs following his death in 1819. Trees felled and branched

by the men were carried along narrow foot paths to the collection station at Waialua, adjoining the Ko`olau Loa District on the north shore, for shipment to Honolulu.

Some records of sandalwood tax collection from the Ko`olau Loa and Waialua Districts to pay sandalwood debts during the 1820s were kept by Stephen Reynolds, a clerk of merchant William French in Honolulu, and by William French in the 1830s (French 1833). The heaviest traffic of schooners and brigs to Waialua, the collection station for the two districts, appears to have been between 1824 and 1829 (Reynolds 1989:28, 29-30, 181, 182, 185, 187, 193, 248, 249, 262, 272) in a effort to pay off accumulated sandalwood debts.

Levi Chamberlain made a tour of O`ahu during the sandalwood collecting period (1828) to examine the mission schools. South of the project area he examined a school of "sandal wood cutters from the mountains" before continuing on his tour to examine four schools in the Ko`olau Loa District. Being a guest of Peka, the Lā`ie *konohiki*, Mr. Chamberlain examined two schools in Lā`ie and Mā-laekahana the following day. After examining the schools, Mr. Chamberlain continued over "a level sandy country" to examine a large school at Kahuku, and a smaller one at Waiale`e (Chamberlain 1957:35, 36). Specific details giving precise locations of the schools, villages, and the population within the districts were not reported by Mr. Chamberlain.

On 24 July 1832, the missionaries Rev. John and Ursula Emerson were received at Waialua by Chief La`anui, and headman Kuakoa, to begin the second mission established on the island of O`ahu. The areas covered by the Emerson's mission were the Ko`olau Loa (generally referred to as "Kahuku"), Waialua, and later, the Wai`anae Districts. The native population was estimated at that time by Rev. Emerson as about 8,000 inhabitants in the three districts, with six settlements along the shoreline of Ko`olau Loa (Emerson 1928:55, 66, 103). Rev. Bingham gave the population about 7,300 (Bingham 1981:468).

My father's (John Emerson) charge included the district of Koolauloa (Long Koolau), the northern side of the island. Although this is only a strip of land from half a mile to a mile in width, running along the foot of cliffs, or bold precipices which terminate many mountain spurs, the soil is good and well watered by small mountain streams and the valleys between the spurs are rich and productive. There were six settlements along the shore with a population of about 2,700... [Emerson 1928:103]

The technology of grass hut construction, the purposes of enclosures, and available resources in these two districts are amply noted throughout the Emerson's letters and journals. Rev. Emerson described Kahuku in 1832 as:

...a populous district green with forests of *Lauhala* [pandanus] trees, nestled among which the homes of the natives were sheltered from the strong winds. They used the choice *luhala* [sic] leaves for lining their grass huts and for skillfully braided mats for their gravel floors, while the fruit also had its uses. [Emerson 1928:134]

Among the uses of the *lauhala* fruit was the identification of the district to whom a person belonged: "Men from Kahuku were identified by leis of the orange hala fruit which they wore by order of their chief when they left their *ahupua`a*." [Wilcox 1975:1]

House construction in Ko`olau Loa and Waialua, using natural resources growing in the districts, was described in detail by Rev. Emerson:

The frame of a native house is built by fitting and tying to a ridgepole other poles which slant from it to the ground, or to upright posts, which in that case frame perpendicular sides. Across the poles are placed horizontally other poles about an inch in diameter and two inches apart, the *aho* [cord], to which is fastened the thatch, which is made of bunches of *pili* grass lapped like shingles. The cords used for tying and fastening are prepared from the strong *ahu-awa* [sedge; *Cyperus javanicus*] reed...

The land on which our houses stand...is enclosed by a sort of palisade of small poles about six feet high so fastened together with the native cord as to make quite a strong fence. This is necessary to keep the horses and goats from carrying off the houses, in other words, from eating them up. [Emerson 1928:57, 58]

Later, stone walls were constructed, not as animal enclosures, but "to keep out roaming cattle, horses, and pigs from cultivated lots" (Emerson 1928:127).

In addition to plants and animals mentioned by Rev. Emerson, Ursula Emerson wrote in letters that taro was "found in abundance in the mountains," and recently introduced fruit available to them "from the uplands" were oranges, lemons, limes, and pineapples. Their firewood was gathered from the forests among the *kukui* (*Aleurites moluccana*), *koa* (*Acacia koa*) *ōhi`a ai* (mountain apple), and *kuawa* (guava; *Psidium guajava*) trees. Sweet potatoes, bananas, arrowroot, and a large variety of historically introduced fruits and vegetables (grapes, figs, corn, beans, cucumbers, squash, cabbage, melons, radishes, small onions) were mentioned by Mrs. Emerson as planted by Hawaiians in their scattered garden plots, and around their houses. Pigs, chickens, ducks, fish, and goat milk were also mentioned (Emerson 1928:66, 84, 96, 100, 151).

Gideon La`anui (1794-1849), the "Christian chief" (*konohiki*) of the Emerson's district, was baptized on 4 December 1825 in Honolulu by the first group of missionaries (Ōi 1983:145). Duties of tax collection from the residents in the district were directed to La`anui by way of written

messages. In 1834 a letter notified La`anui that a person was being sent to collect potatoes and *poi*, and that he was to get *puakai* (*pukai*; lime), medicinal herbs, ship some fish, and “hire” a man to get tapa material from the mountains. A message sent in 1837 stated that the king wanted hogs, fish and food. Other messages included the instructions “to go fishing” for fish and shrimp; “get some lime if matured,” ship wood, sandalwood, food, and potatoes. While in port, La`anui was to supply the sailors on the King’s vessel with food and fish (Department of the Interior: 1834, 1838a - 1838e).

2.2.4 Land Tenure Change: The Great Mahele

Until 1841, Hawaiian lands were owned by the King and administered by chiefs, with use rights assigned to them. Lands occupied by Hawaiians under a chief, or held by foreigners (in agreement with the king or various island chiefs), were subject to seizure and redistribution. The status of land tenure during the early post-Contact period was felt by foreigners to be a detriment to investment and the development of Western plantation agriculture, farming, and ranching. This resulted in the adoption of western judicial systems (e.g., trials) in 1832, codes of laws in 1833 and 1839 (superseded 1842), and the first Hawaiian Constitution in June 1840. The Hawaiian Constitution provided for the appointment of a legislature composed of the King, 16 chiefs, and 7 elected representatives (Department of the Interior 1840).

The first Hawaiian legislative meeting, held on 1 April 1841, authorized the governor of each island to lease tracts of lands for periods up to, but not exceeding, 50 years (Department of the Interior 1841). The most important change occurred during the period commonly referred to as the Great Mahele, the great division of lands signaling the transition from traditional Hawaiian concepts of land ownership to the Western concept of individual fee simple land ownership. The transition occurred in several stages between 1845 and 1854 (Chinen 1978:10). Initially, King Kamehameha III divided the lands into four categories: 1) the lands belonging to the King, 2) the government, 3) chiefs and *konohiki*, and 4) the commoners (Chinen 1978:15-16). Article 4, Chapter 7, of the Hawaiian Legislature, passed on 10 December 1845, provided for the Privy Council to appoint a Board of Commissioners to Quiet Land Titles. The Board reviewed claims by chiefs and commoners and made Land Claim Awards (LCA).

Two hundred sixty-nine land claim applications, indicating a minimum population of approximately 800 people, were applied for by residents of the Ko`olau Loa District. Hawai`i government survey maps detail coastal *kuleana* but the locations of upland *kuleana* are non-

existent. In 1873, the boundaries of the government land of Kahuku belonging to the Kahuku Ranch Company were still unsettled (Department of the Interior Letters: 1873). Some of the small *kuleana* land claim awards located along the lowlands of Ko`olau Loa appear on tax maps; others, as late as 1993, are listed in the tax records as "unlocated *kuleana*" (ten are currently designated as unlocated in TMK 5-5-07:3). The individual land claims are accompanied by testimonies which prove very useful in determining land use patterns during that time.

The Land Commission Award Testimonies for the *ahupua`a* that the Kahuku Training Area is located in have been completely recorded and are presented in Appendix A. Examination of these testimonies indicate that many of the inhabitants had lived in the Ko`olau Loa District since the time of King Kamehameha I or earlier. The testimonies also indicate that the Ko`olau Loa District was rich in resources of all sorts, providing it's inhabitants with all the necessary material needs to sustain life. The testimonies indicate not only an emphasis on coastal resources, but on inland resources as well. If the Kahuku Land Commission Award testimonies are used as an example for the broader Ko`olau Loa District then land use for the District could be described as follows. The coastal areas were utilized for habitation as well as exploitation of the coastal resources in a variety of ways including fish *lo`i*, fishponds (aquaculture), and fisheries. No doubt shell fish, and sea vegetation were also exploited, however, were not mentioned in the testimonies.

Habitation also occurred in the flatland areas and both irrigated agriculture (*lo`i*) and non-irrigated agriculture (*kula*) was practiced. The *lo`i* were cultivated in taro, whereas the *kula* contained a number of both traditional and non-traditional plants. These plants included; *wauke* (*Broussonetia papyrifera*, Paper Mulberry), coconuts, bananas, sweet potatoes, *hala* (*Pandanus tectorius*), sugarcane, `awa (*Piper Methysticum*, Kava), *ipu*, (gourd), *akaakai* (onions), watermelon, *alani* (oranges), `olena (*Curcuma domestica*, tumeric or ginger), *papapapa* (beans), `ulu (*Artocarpus communis*, breadfruit), and *ipu `awa`awa* (bitter gourd).

The upland areas were also described as being exploited for a number of resources, some of which required cultivation. These included; *hala* (*Pandanus tectorius*), banana, *noni* (*Morinda citrifolia*, Indian Mulberry), *pili* (*Heteropogon contortus*, Twisted Beardgrass), *koa* (*Acacia koa*), `awa (*Piper Methysticum*, Kava), sweet potatoes, *kukui* (*Aleurites moluccana*, Candlernut tree), *wauke* (*Broussonetia papyrifera*, Paper Mulberry), `ohi`a (*Metrosideros*), *ti* (*Cordyline terminalis*, Kī), *olona* (*Touchardia latifolia*).

In addition, the valleys were noted as places where *noni* (*Morinda citrifolia*, Indian Mulberry), banana, and sweet potato grew. Other resources mentioned in the Land Commission Award Testimonies without a location included salt, pigs, wiliwili trees, pasture land, watercourses, and a *holua* (slide).

Most of the Ko`olau Loa lands were then granted, leased, or sold to foreigners after 1850 for pasturing of cattle and sheep, developing most of the Ko`olau Loa District into ranches known as Mālaekahana and Kahuku Ranches.

Kahuku had passed from the control of its chief to that of an Englishman. The pastures of his big ranch extended along the shore for 12 miles, reaching inland to the mountain chain, and he was so autocratic that the natives could not own a dog, or pasture a cow or horse, without his consent. The depredations of herds and flocks on their small homesteads became unbearable, but they appealed in vain for their beloved *hala* trees and patches of vegetables... There was no redress, however, and with the fading of the forests the people also disappeared and the once populous district of Kahuku [Ko`olau Loa] became a lonely sheep and cattle ranch. [Emerson 1928:135-136]

2.2.5 Mālaekahana and Kahuku Ranches

Cattle and sheep were introduced to Hawai`i by Captain George Vancouver as a gift Kamehameha I in 1794, with a twenty-year *kapu* agreement to allow the cattle to multiply (Vancouver 1984:812). By the end of the *kapu* period, the cattle had become so troublesome that bullock hunters were engaged by Kamehameha I to hunt the cattle for their skins and tallow. The tenuous nature of foreign possession of lands for economic enterprises, prior to the Great Mahele, prohibited most foreign investments. Honolulu merchant, William French, however, acquired Hawai`i Island property for ranching in 1838, trading a "beautiful horse" to Governor Kuakini for use of the premises, beginning the first cattle ranch in the Hawaiian Islands (Board of Land Commissioners, Foreign Testimony 2:157-168, 171, 305).

The formation of Charles Hopkins' Mālaekahana Ranch appears to have begun with his purchase of livestock at Kahuku from Joseph Booth on 8 April 1850 (Bureau of Land Conveyances Liber 4:137). Robert Moffitt, owner of the Kahuku Ranch, began the ranch by acquiring large leases of Government lands in Ko`olau Loa in 1852. In land transactions between Hopkins and Moffitt in 1858, sheep, as well as cattle were apparently raised on the ranches (Bureau of Land Conveyances Liber 5:536).

A large number of deeds, grants, mortgages, and other land conveyances, from the formation of Mā-laekahana "Rancho" by Charles G. Hopkins, and Kahuku Ranch by Robert (Stoney) Moffitt from the early 1850s, until the charter of the Kahuku Plantation company in 1890, are filed with the Bureau of Land Conveyances. The major land transactions during the formation and ownership of Mālaekahana and Kahuku Ranches illustrates the change of land use in the Kahuku Training Area from pastures and ranching to a cultivated sugarcane plantation.

Combining the ranches, Malaekahana Ranch interest was purchased by Herman A. Widemann in 1867 and 1872 from Charles K. Hopkins, then residing in Montreal, Canada. Kahuku Ranch was purchased by Widemann from T.H. Stoney of Frankfort, Ireland, heir of Robert Stoney (alias Moffitt) in January 1873 (Bureau of Land Conveyances Libers 35:297-299; 39:1-5). Malaekahana and Kahuku Ranches were then sold by indenture of mortgage to Julius L. Richardson on 19 January 1874 (Bureau of Land Conveyances Liber 38:473-477).

James Campbell, a sugar planter in Lahaina, Maui purchased "Kahuku and Malekahana Ranch" from J.A. Richardson on 2 October 1876 for \$63,500.00. The ranches were comprised of the following land and properties in Ko`olau Loa on the date of sale to Campbell:

- I. 1) *ahupua`a* of Mālaekahana
 - 2) *ahupua`a* of Ke`ana
 - 3) *ahupua`a* of Kahuku
 - 4) *ahupua`a* of Ulupehupehu, Hanakaoe, `Ō`io and 1 and 2
 - 5) *ahupua`a* of Kawela
 - 6) *ahupua`a* of Opana 1 and 2
 - 7) *ahupua`a* of Pahipahi`ālua
 - 8) *ahupua`a* of Kaunala
 - 9) Leaseholds, ~3,000 branded cattle, 90 head horses, ~1700 sheep running or grazing on the ranch or adjacent lands, carts, yolks, harness, agricultural implements, tools, furniture, personal and mixed property.
- II. 1) *ahupua`a* of Pūpūkea
 - 2) *ahupua`a* of Paumalū
 - 3) *ahupua`a* of Wai`alee
 - 4) indentures and leases.

2.2.6 Kahuku Sugar Plantation

Early European visitors recognized the potential of Hawai'i developing sugarcane plantations. Captain Peter Puget observed in 1793 that "large and luxurious Growth [of sugarcane]... would abundantly repay in Quantity any Labor bestowed on it in Sugar and Rum" (Bradley 1968:24). Officer Menzies, with Vancouver's voyage in 1793 thought:

...that it would be profitable for the British government to encourage the settlement of a few West India planters at the Hawaiian Islands inasmuch as sugar could be cultivated there by cheap labor without the necessity of recourse to slavery... [Bradley 1968:24, 42]

Captain Iurii (Yuri) Fedorovich Lisianskii, with the Russian exploration voyages of the Pacific Ocean in 1804 wrote:

The sugar-cane also thrives here, the cultivation of which alone would yield a tolerable revenue, if sugar and rum were made of it; and the more so, as the use of these articles is already known to the savages of the north-west coast of America. [Barratt 1987:71]

The first sugar plantation in Hawai'i appears to have been initiated by a foreigner, John Wilkinson at Pu'u Pueo in Manoa Valley (behind Honolulu) about 1824. The mill and cane fields were taken over by Governor Boki and foreign partners following Wilkinsons' death in 1826. When the Pu'u Pueo plantation sugar was ground and distilled into rum, "a bad business" as described by one of the partners, Stephen Reynolds, the fields were destroyed by Queen Ka'ahumanu (Reynolds 1989:177, 254, 255, 263, 266, 267). Milled sugar in Ko'olau Loa and Waialua Districts was first ground on shares for Hawaiians by Rev. John Emerson in 1836 (Conde' and Best 1973:340). The crude sugar mill was used by the boys Boarding School at Waialua (1840-1843) through which the cultivation and sale of the sugar made the school self-supporting (Bradley 1968:351-354).

The Kahuku Plantation Company was chartered on 4 February 1890 (Department of the Interior, 43:54) by sugar planters James Campbell, James B. Castle, and Benjamin F. Dillingham (founder of the Oahu Railway and Land Company in 1888). In 1889, Dillingham's Oahu Railway and Land Company leased various pieces of land from Campbell to build a railroad from Honouliuli, 'Ewa, to the Kahuku Sugar Mill at Kahuku, Ko'olau Loa. Right to pasturage; working stock and animals; spring waters, running streams, artesian wells, and rights to "take deadwood from the mountains for fuel," to dig up, carry away, and use the soil and rock;" and use of the present ocean landing were subleased from Dillingham to Castle in December 1889 (Bureau of Conveyances 121:372; 128:143-155). The railroad reached "Waialua in 1898, and Kahuku in 1899...[in] the

early part of the twentieth century the Koolau Railroad was built along O`ahu's windward coast from Kahuku to Kahana Bay" (Mifflin 1983:64, 65). The Koolau Railway was purchased by the Kahuku Plantation Company in 1931 (Conde and Best 1973:308, 309).

Small-scale pineapple cultivation on Kahuku Plantation lands was begun about 1916 with additional leases of small parcels of land for pineapple leased to individual growers between 1921 and 1927 (Bureau of Land Conveyances 443:364-365; 832:267, 259; 885:105, 235). As the small leases expired, many of them mortgaged, the leases were acquired by the California Packing Company. Some portions of the Kahuku Training Area are former pineapple fields and contain plantation camp sites located in Kahuku, Keana/Mālaekahana, and Hanakoae/Kawela *ahupua`a*.

To clear titles to the Campbell Estate lands, survey maps of the plantation were submitted with Land Court Application 1095 in 1934 (Campbell Estate map 2736). The 1934 maps, showing the locations and boundaries of the pineapple fields and camp sites, have not yet been updated, and are currently used by the Hawaii State Tax Office as the standard base map of the area.

Dismantling of railroad tracks, and scrapping of railroad cars between 1948 and 1951, signaled the end of the O`ahu railroad era (Oahu Railway and Land Company 1946:11; 1948:8, 1951:4,7). Cane fields, serviced by portable cane trains at the Kahuku Plantation, were dispensed in 1954 (Conde and Best 1973:297-300), and 280 acres were initially leased to the U.S. Government in 1956 for the Kahuku Training Area. Additional leases at later dates expanded the facility to its present size of over 9,600 acres.

The Kahuku Training Area was used by divisions stationed at Schofield Barracks for war games, which contributed to serious topsoil erosion by the use of heavy army vehicles, and by jeeps crossing the ridges. "Heavy rains up in the mountains have stripped the grasses and low-lying vegetation from much of the [Kahuku] training area" (Honolulu Star-Bulletin, 4 May 1970:A2.2.4). In an effort to "halt wind and water erosion," the 29th Infantry Brigade of the Hawaii National Guard, with a motto to plant "a tree in every fox hole," planted 3,000 pine tree seedlings in the foxholes behind Kahuku in 1970 (Honolulu Star-Bulletin, 4 August 1970:A-11.4.1).

3.0 ARCHAEOLOGICAL SITE INVENTORY AND EVALUATION

This section is presented to inform military users of Kahuku Training Area about the known archaeological and historical resources at KTA. These resources are described, located, and

assessed for significance. In addition, a model of probability for archaeological and historical resources yet to be identified at KTA is presented.

3.1 ARCHAEOLOGICAL INVESTIGATIONS WITHIN KAHUKU TRAINING AREA

Previous archaeological studies have identified 24 historic properties within KTA. These have been designated on the Statewide Inventory of Historic Places (SIHP) list. The SIHP site number (e.g., SIHP Site 50-80-02-2501) is a 10-digit geographic location code that has four groups of numbers; the first referring to the State of Hawaii (50), the second referring to the island of O`ahu (80), the third referring to the particular United States Geologic Survey (USGS) quadrangle map (02), and the fourth referring to the individual site number (2501). As a matter of convenience, these site numbers are often shortened to just the unique site number when discussed (e.g., Site 2501). Site locations are shown on Figure 2.

Numerous archaeological projects have been undertaken within the northern *ahupua`a* of the Ko`olau Loa District, including several projects within the 17 traditional *ahupua`a* that KTA incorporates. There are approximately 120 archaeological or related multidisciplinary reports within the SHPD library that focus on this area. With a few exceptions, most of these studies pertain to the coastal zone or portions of the coastal plain, and were undertaken in response to developmental actions, such as beach park improvements, resort expansion, flood control projects, agricultural park development, and residential complex developments. Only six studies have been undertaken within portions of the Kahuku Training Area (Figure 3): McAllister (1933), Chapman (1970), Rosendahl (1977), Davis (1981), and Williams et al. (1995), and Farrell and Cleghorn (1995). Review of these studies enables the formulation of predictive models for site and feature types to be found in the area, and development of a settlement pattern model for northern Ko`olau Loa.

McAllister (1933) recorded two sites, Sites 259 and 260, near the coast during his limited visit to the area. Site 259 was a legendary stone named Waikane, and Site 260 was a temple named Pu`uala Heiau. Both site areas were pointed out to him by local Hawaiian informants, but the stone features no longer existed at the time.

Chapman (1970) limited his work to recording a single site, Site 2501, reported by some hikers. After clearing the Christmas berry overgrowth, Chapman was able to make a sketch and record a brief description. His field notes state:

Flat deck revealed, about 4 by 7 m, upslope about a meter off the ground, and downslope about 2.5 m above the surface. Farther down slope, possibly two earlier levels of construction remain beneath the rubble collapse. Firm clean and slightly bulging wall on up valley, south side; heavy well-made wall or facing on north side about 2.5 to 3 m high. Quite massive. No other structure reported nearby, about 3000 ft from stream bed. Suggest burial from massive quality and isolation, but could be agricultural heiau. [Chapman field notes 1970]

Subsequently, the State Historic Preservation Office conducted a statewide archaeological inventory and nominated the site to the National Register of Historic Places (NRHP). The site was accepted and listed on the NRHP on August 14, 1973.

Rosendahl's (1977) study was a sample survey of selected portions of KTA and was limited in areal extent, covering 1,044 acres (approximately 10%) of the 9,646 acre installation. In addition to the three sites noted above, the study identified six additional archaeological sites. These sites include: Site 1043, Kawela Agricultural Terraces; Site 9506, Kea`aalu Ditch; Site 9507, `O`io Stream Terrace; Site 9508; East `O`io Gulch Platform; Site 9509, `O`io Gulch Complex; and Site 9517, Kancalii Agricultural Structures. Two of these sites (1043 and 9517) are reported by Rosendahl to have been destroyed or not located, as were Sites 259 and 260. Four (Sites 9506-9509) were new site designations.

Of the four new sites recorded during Rosendahl's survey, Site 9506 is a historic period stone-faced irrigation ditch in Kea`aalu Gulch; Site 9507 is a stone-faced terrace located in East `O`io Gulch; Site 9508 is a stone platform located in East `O`io Gulch; and site 9509 is a complex of small stone-faced agricultural terraces located in `O`io Gulch. All of these sites are in poor condition and the ages of the latter three are undetermined.

Subsequent to Rosendahl's (1977) survey, Davis (1981) conducted an archaeological reconnaissance-level survey of proposed windmill sites within selected areas of KTA. His survey resulted in the identification of four additional sites. Site 2357 (Davis 1981:11) was a discontinuous wall remnant of roughly piled stones, which supported a barbed-wire fence on milled wooden posts. The wall marked the boundary of a small pineapple farm dating to 1930, and Davis interpreted the wall as a 20th century feature.

The other three sites identified by Davis, Sites 2358, 2359, and 2360, form a discrete complex set within a small swale in upland `Opana, approximately 250 meters inland and southeast of the Naval Computer and Telecommunications Area Master Station (NCTAMS) Satellite Communications (SATCOM) facility. Together the three sites, set within a 120 sq. m area

adjacent to the eastern edge of a jeep road, comprise a small traditional Hawaiian residential complex, including a house site, two habitation terraces and a terrace with possible religious function. Davis attributed the placement of the site within the swale to the strong winds in the area. He suggests that the site was chosen as a habitation and agricultural area because the swale affords protection from the wind (Davis 1981:19). This complex was located within the proposed boundary of the Kahuku Windfarm Turbine Site 10 construction impact area, and was recommended to be either avoided, monitored during construction, or salvaged (Davis 1981:20). Since there are no subsequent reports available on these sites at the Bishop Museum or at the SHPD, and the wind turbine is in place, it is assumed that construction proceeded without further work undertaken and the sites are destroyed.

During preparation for the 50th anniversary of the Japanese attack of O`ahu, the National Park Service, in conjunction with the Department of Defense Legacy Resources Program, determined that Site 9745, `Ōpana Mobile Radar Station, was eligible for inclusion on the NRHP and was nominated as a National Historic Landmark. It is the location of a World War II mobile radar station, located on the ridge near the current NCTAMS SATCOM facility. This site is within KTA and is under U.S. Army jurisdiction.

The `Ōpana Mobile Radar Station played a critical role at the outbreak of the war. Located near Kahuku Point at 230 feet above sea level, the `Ōpana site was one of six Army radar stations established along O`ahu's coastline in November 1941. At the `Ōpana site on 7 December 1941, Privates Joseph L. Lockard and George E. Elliott observed more than fifty planes bearing down on the island from approximately 130 miles to the north. Within the hour, Japanese planes attacked Pearl Harbor, an event which brought the United States into World War II. Site 9745 was officially listed in the HRHP on 2 June 1990, on the NRHP on 19 September 1991, and as a National Historic Landmark on 19 April 1994.

In 1992, archaeological reconnaissance and historical investigations were conducted in a portion of Kahuku Training Area known as Punamano Communication Station (Farrell and Cleghorn 1995). Cultural remains within this project area had been assigned State Site number 0599, and included structures, features, and artifacts mainly dating to the post World War II era. However, three bunkers dating to World War II are considered potentially eligible for inclusion in the National Register of Historic Places (Farrell and Cleghorn 1995:i).

In early 1994, Williams et al. (1995) (Appendix B of this HHP) conducted a limited archaeological inventory of selected areas within KTA. That study reviewed the previous archaeological research, and included inspection of some of the previously surveyed site areas to determine current site conditions and status. The study resulted in the identification of nine new sites. Three are military features: Site 4881, an octagonal concrete slab; Site 4882, a bunker; and Site 4886, another bunker. Sites 4882 and 4886 are World War II era coastal defenses, and Site 4881 is thought to be the remains of a military observation post. Site 4883 is a plantation-era house site with early to mid-20th century refuse. Sites 4884, 4885, 4887, and 4888 are traditional Hawaiian in origin. Site 4884 is an isolated upland *imu* (cooking hearth); Site 4885 is a *heiau*, an ancient temple; Site 4887 is a probable habitation complex containing 11 features; and Site 4888 is a probable planting/garden area.

3.1.1 Summary of Known Cultural Resources at KTA

Twenty-four cultural resources have been identified within KTA (Table 1). Eight of these sites (Sites 259,260, 1043, 2357-2360, and 9517) are presumed to have been destroyed, but have not undergone systematic archaeological inventory survey and subsurface testing, and therefore have potential to contain either undisturbed surface or subsurface resources. Fifteen cultural resources still exist at KTA (Sites 2501, 9506-9509, 4881-4888, 4930, 0599, and 9745). Twelve of these sites (Sites 9506-9509, 4882-4888, 4930, 0599) are eligible or potentially eligible for nomination to the HRHP and NRHP. Sites 2501 Hanakoa Platform, 4884 *imu* (cooking hearth), 4885 Pahipahialua *Heiau*, 4887 habitation and agricultural complex, and 4888 upland garden area, have confirmed Pre-Contact Traditional Hawaiian origins. Site 2501 Hanakoa Platform is listed on the NRHP. Sites 4881 Octagonal Concrete Slab/observation post, 4882 World War II era bunker, 4886 World War II era Pentagonal Bunker, Site 0599 World War II era bunkers associated with Punamano Communication Station, and 9745 Opana Mobile Radar Station have military origins. Importantly, Site 9745 Opana Mobile Radar Station, is a commemorative National Historic Landmark and is listed on the NRHP and HRHP. Sites 4882 and 4886 are potentially eligible for inclusion on the HRHP and NRHP as World War II era historic properties. Site 4881 does not have confirmed origin or association to World War II, and is therefore not presently eligible for nomination to the HRHP or NRHP. Site 9506 is a Post-Contact plantation era irrigation ditch, and Site 4883 is Post-Contact plantation era residential complex. Sites 9507-9509, and 4930 have unconfirmed temporal origins, being either Pre-Contact traditional Hawaiian agricultural features or Post-Contact plantation era features. Further research is necessary to confirm the origin of these sites, and to evaluate eligibility for NRHP.

Table 1. Summary of Known Cultural Resources at Kahuku Training Area

Site Number and Name	Site Type	Temporal Origin	NRHP Eligibility	Applicable NRHP Criteria
50-80-02-259 Waikane Stone	Cultural site associated to legends about Hawaiian demigods	Pre-Contact	No- Destroyed or unlocated	Not Applicable
50-80-02-260 Pu'ula Heiau	Religious and Ceremonial Site	Pre-Contact	No- Destroyed, unlocated, or mislocated	Not Applicable
50-80-02-1043 Kawela Terraces	Agricultural Terraces	Pre-Contact	Undetermined**Surface area reported destroyed	Undetermined***
50-80-02-2357	Pineapple Plantation Boundary Wall	Post-Contact 20th Century	No- Presumed Destroyed by Kahuku Windfarm Development	Not Applicable
50-80-02--2358	Habitation Complex	Pre-Contact	No- Presumed Destroyed by Kahuku Windfarm Development	Not Applicable
50-80-02-2359	Habitation Terraces	Pre-Contact	No- Presumed Destroyed by Kahuku Windfarm Development	Not Applicable
50-80-02-2360	Possible Ceremonial Terrace/Platform	Pre-Contact	No- Presumed Destroyed by Kahuku Windfarm Development	Not Applicable
50-80-02-2501 Hanakoae Platform	<i>Heiau</i> ; Religious and Ceremonial, and Possible Burial Site	Pre-Contact	Yes NRHP Listed 8/14/73	a, c, d
50-80-02-9506 Keaaulu Ditch	Plantation irrigation ditch	Post-Contact	Yes	a, d
50-80-02-9507 `O'io Stream Terrace	Agricultural terrace	Undetermined* (Pre- or Post-Contact)	Undetermined**	Undetermined***
50-80-02-9508 East `O'io Gulch Platform	Stepped Stone Platform	Undetermined* (Pre- or Post-Contact)	Undetermined**	Undetermined***
50-80-02-9509 `O'io Gulch Complex	Agricultural Terraces with Possible Associated Habitation Features	Undetermined* (Pre- or Post-Contact)	Undetermined**	Undetermined***

Table 1 (continued). Summary of Known Cultural Resources at Kahuku Training Area

Site Number and Name	Site Type	Temporal Origin	NRHP Eligibility	Applicable NRHP Criteria
50-80-02-9517 Kaneali'i Structures	Irrigated Agricultural Terraces	Undetermined* (Pre- or Post- Contact); surface destroyed	Undetermined** Presumed Destroyed by Plantation Agriculture	Undetermined***
50-80-02-4881	Octagonal Concrete Slab; probable training maneuver observation post	Military Era probable post- WWII construction	Undetermined**	Undetermined***
50-80-02-4882	Bunker	Military Era World War II	Yes	a, c, d
50-80-02-4883	Residential Complex	Post-Contact Plantation era; Early to Middle 20th Century	Yes	d
50-80-02-4884	<i>Imu</i> (Cooking Hearth)	Pre-Contact	Yes	d
50-80-02-4885 Pahipahialua <i>Heiau</i>	Religious and Ceremonial Site	Pre-Contact	Yes	a, c, d
50-80-02-4886	Pentagonal Bunker Coastal Defense	Military Era World War II	Yes	a, c, d
50-80-02-4887	Habitation and Agricultural Complex	Pre-Contact	Yes	a, c, d
50-80-02-4888	Agricultural Site	Pre-Contact	Yes	d
50-80-02-4930	Linear rock mound	Undetermined* (Pre- or Post- Contact)	Undetermined**	Undetermined***
50-80-02-0599	Military Bunkers	World War II	Yes	a, c
50-80-02-9745 `Opana Mobile Radar Station	National Historic Landmark Listed 4/19/94	Military Era World War II	Yes NRHP Listed 9/19/91 HRHP Listed 6/2/90	a, c, d

* Further research is necessary to determine temporal origin.

** Further research is necessary to determine NRHP eligibility.

*** Insufficient data available at present to evaluate the resource; further research and data collection is necessary. Shaded sites are reported/presumed destroyed but have not undergone systematic archaeological survey since original site description was reported, and therefore have potential to contain undisturbed, associated surface or subsurface resources. "Pre-Contact" refers to the Traditional Hawaiian cultural period prior to arrival of Captain James Cook in Hawai'i in A.D. 1778. "Post-Contact" refers to Historical Period after A.D. 1778. NRHP = National Register of Historic Places. HRHP = Hawaii Register of Historic Places. [Data Sources: McAllister 1933; Chapman 1970; Rosendahl 1977; Davis 1981, 1982; Williams and Patolo 1995]

SECTION 3.2 SIGNIFICANCE ASSESSMENTS

The recognition that historic and prehistoric sites (i.e., cultural resources) are valuable to society is reflected in the federal laws and regulations designed for their protection. Based on existing legislation, cultural resources are those historic and prehistoric sites, artifacts, features, and other humanly produced elements that represent or reflect the heritage of the people within an area of affected environment. Prehistoric resources may vary from individual isolated features to site complexes that may include midden deposits, fish ponds, and any number of related features. Historic resources may vary from an individual structure, or remains of a structure, to a complex of structures encompassing an entire community. Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665), as amended, is designed to ensure that historic properties (i.e., significant cultural resources) are considered during Federal project planning and execution.

3.2.1 Significance Evaluation Criteria

The National Register of Historic Places (NRHP), title 36 CFR 60.4, defines the criteria for legally evaluating the significance of cultural resources.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method or construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

In addition, amendments to the National Historic Preservation Act include a provision stating that "Properties of traditional religious and cultural importance to an Indian Tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the National Register" (§101(d)(6)(A)).

3.2.2 Significant Historic Properties At Kahuku Training Area

Two of the 24 sites, Site 2501, Hanakoa Platform, and Site 9745, Opana Mobile Radar Site, are listed on the National Register of Historic Places (NRHP), and Site 9745 is also a National Historic Landmark (NHL). Fifteen sites are of traditional Hawaiian origin: Sites 259, 260, 1043, 2358, 2359, 2360, 2501, 9507 through 9509, 9517, 4884, 4885, 4887, and 4888; seven of these (Sites 259, 260, 1043, 2358, 2359, 2360, and 9517) are presumed to have been destroyed since their original reporting, but are included because the site areas have not undergone systematic subsurface archaeological testing and there is potential for subsurface resources to be present in these site locations. Five sites are World War II era military sites: Sites 0599, 4881, 4882, 4886, and 9745. Two sites have post-Contact plantation-era origins: Sites 4883, and 9506. Site 4930 appears to be a traditional Hawaiian site, but more detailed, systematic archaeological study is required to determine its origin. Each site is briefly described below with its significance assessed.

3.2.2.1 Site 50-80-02-259 Waikane Stone

McAllister (1933:152) described Site 259 as:

Site 259. Large stone, known as Waikane, beside the stream bed on the mountain side of Kawela Bay, and at the foot of the palis in the land of Hanakoa. "Long ago the Hawaiians had to go far up the valley in order to get fresh water, but when Kane struck the stone water flowed from it and continued to flow up to the time the plantation built a pump just below the rock." [McAllister 1933:152]

Handy (1940:88) describes the spring-watered terrace areas of Opana and Hanakoa and reprises McAllister's description of the Waikane stone.

In reviewing Rosendahl's 1977 report, including appendices, it is not clear whether the site was not located or simply not found. The report suggests the site may actually be outside the boundary for the Kahuku Training Area, further suggesting it is not at the previously designated location, or that the site is indeed destroyed, or altered so as to be unrecognizable. McAllister (1933) indicates a plantation well was established just below the rock, suggesting the former spring is capped or that a well head is located in the vicinity. Neither the 1939 Campbell Estate maps, or the 1887 Kahuku Ranch maps, or the Kahuku Plantation map show the location of either a well or terraces in the area. No maps or illustrations of this site are available.

3.2.2.2 Site 50-80-02-260 Pu`u`ala Heiau

Site 260, Pu`u`ala Heiau, was apparently destroyed prior to McAllister's survey, or existed as a location rather than a structure. The *heiau* is neither described by class (e.g., sacrificial,

agricultural, or other type), nor are any dimensions offered in McAllister's brief description, which reads, "Site 260. Puu'ala heiau, said to have been located on the ridge overlooking Kahuku ranch. There is now no evidence of any type of a structure on this bare hill." (McAllister 1933:152).

Inspection of Thrum's various lists of O'ahu *heiau* (1921, 1917, 1909, 1907, 1901) indicates Thrum was not informed of its existence. Moreover, J.F.G. Stokes (n.d.) notes and site card files do not contain any references to this *heiau*, suggesting it may have been destroyed prior to their research, or that information as to its existence was lacking. Sterling and Summers (1978:149) reprise McAllister's description, cite a reference to the area in a Hawaiian newspaper, and plot the location according to McAllister's notes. The news article states "When Keaua'ula reached Pu'u'ala [sic] in Kahuku, he met some people who were indulging in sports there. They were spear throwing and *moa* sliding and they urged him to stop and play" (Sterling and Summers 1978:149). Rosendahl's (1977) survey apparently included inspection of this area, but did not identify any surface remains. A brief search of additional records (e.g. State Archives, SHPD files; Bishop Museum records) failed to reveal any other reference to this site. No maps or illustrations of this site are available.

The name Pu'u'ala may be interpreted at least two ways; 1) hill path or hill trail (*pu'u + ala*), which may be appropriate since the subject of the above tale was traveling, and perhaps this site was near the juncture of major trails, or 2) sweet potato hill (*pu'u + 'u'ala*) which could be appropriate as the area was known to be the focus of sweet potato gardening, especially on the *kula*. In either case, the *heiau* has apparently been destroyed, or was never located, and there is very sketchy information about this structure. Review of McAllister's notes (O'ahu field notes, books I, II, III 1929-1930) revealed no additional information. Without structural or subsurface remains, the site is not eligible for the NRHP, although the hill itself can be considered to hold traditional value to modern Hawaiians as a former *heiau* site.

Williams et al. (1995) conducted a survey of the hilltop that the *heiau* was reported to be located on, and did not find any surface indications of its existence. The hilltop has been heavily modified by modern construction, and there is little or no potential for intact subsurface deposits. On the hill adjacent to the plotted location, however, they did find the remnant of a stone terrace facing (Site 4930), although the relationship of this, if any, to the *heiau* is unknown. It is possible, though, that McAllister plotted his site location on the wrong hill, and that Site 4930 is the remains of the *heiau* foundation.

3.2.2.3 Site 50-80-02-1043 Kawela Agriculture Terraces

Site 50-80-02-1043, the Kawela Agricultural Terraces, was apparently destroyed by Kahuku Plantation development (Rosendahl 1977), yet Rosendahl's reference is to Handy's (1940) description of Opana wherein he includes reference to McAllister's (1933:152) Sites 258 and 259. Site 258 is a fishpond located at Kawela Bay, while Site 259 is Waikane Stone and was not relocated. Apparently, the spring which sprang from Waikane Stone watered a group terraces at the base of the *pali* there. This land was apparently converted to sugarcane lands by Kahuku Plantation, and therefore, the terraces may in fact have been destroyed. No maps or illustrations of this site are available. Further inventory level survey is warranted, as subsurface resources may yet exist within the area, and the lower *pali* slopes (*kula*) may contain other features, such as habitation sites or sweet potato gardens (Handy 1940; Handy and Handy 1972). If other surface features or subsurface remains exist, they would be significant under NRHP criterion D for their information content.

3.2.2.4 Site 50-80-02-2358 Habitation Complex

Davis (1981) identified and described this site, which was found in a small swale on the slope

[REDACTED]
[REDACTED] The site is part of a cluster of three sites (including Sites 2358, 2359, and 2360), which conform to traditional Hawaiian residential complexes, although Site 2358 may also have been occupied during the ranch or plantation era:

This is one of three sites located in a protected upland swale [REDACTED] [REDACTED] the swale trends generally from north to south (downhill), with the main ridge overlooking [REDACTED] to the east and a hillock of lava outcropping on the west. The swale is about 45 m (130 ft) wide at the uphill end and opens onto a broad flat about 100 m (330 ft) downhill. The bottom of the swale is characterized by sheet-washed alluviums eroded from the surrounding higher ground.

The house site is built against the hill on the west side of the swale. Overall, it measures about 13 m north-south by 10 m east-west (43 by 33 ft). For the most part, the walls are mere low rubble facings along natural contours, dividing the site into four relatively distinct floor areas. The best of these unpaved floor areas, in the southeast quarter of the site, is roughly 4 by 5 m (13 by 16 ft) and stands about 60 cm (24 in) high at the downhill facing. From this level the other three floors step up and back 25 to 55 cm (10 to 20 in) high and blend into the natural slope behind the main floor.

No hearths or other non-portable features were observed on the surface, nor were prehistoric-type artifacts or other cultural refuse in evidence. Not including the

ubiquitous presence of military trash, however, a number of historic items were recorded. These items are as follows: one horse shoe, one sherd of recent Japanese or Chinese commercial ceramic ware, and four metal enamelware pots—one of which was stamped “Made in Germany”. [Davis 1981: 11-15]

This site was not relocated during the Williams et al. (1995) survey and apparently was destroyed during the Kahuku Windfarm development. No records of archaeological mitigation have been found. If surface features or subsurface remains exist, they would be significant under NRHP criterion D for their information content.

3.2.2.5 Site 50-80-02-2359 Two Habitation Terraces

Davis (1981) identified and described this site, which was found in a small swale on the slope

██████████ The site is part of a cluster of three sites (including Sites 50-80-02-2358, -2359, and -2360), which conform to traditional Hawaiian residential complexes:

This site has two adjacent features. Both are stone-faced terraces built against the east slope of the swale, opposite the house site. In contrast to the house site, these features were rather well constructed, with lave boulders and cobbles stacked to form relatively high straight facings along the downhill side. Feature A, on the north, is about 10.5 m (34 ft) long across the face and stands approximately 1.2 m (4 ft) high. Feature B is about 5 m (16 ft) to the south and measures 12 m (ft) long across the face by 1.4 m (4.5 ft) high. Both features have been partially buried by eroded materials from the slope behind and are cut across by a jeep trail. It is therefore difficult to determine the original width of the platforms, although 5 to 6 m (16 to 19 ft) seems a reasonable estimate. No other surface evidence was observed at this site. [Davis 1981:15]

This site was not relocated during the Williams et al. (1995) survey and apparently was destroyed during the Kahuku Windfarm development. No records of archaeological mitigation have been found. If surface features or subsurface remains exist, they would be significant under NRHP criterion D for their information content.

3.2.2.6 Site 50-80-02-2360 Terrace/Platform (Possible Ceremonial Structure)

Davis (1981) identified and described this site, which was found in a small swale on the slope

██████████ The site is part of a cluster of three sites (including Sites 50-80-02-2358, -2359, and -2360), which conform to traditional Hawaiian residential complex patterns:

This structure is a narrow stone-faced terrace built up on the hillside to the west of the swale and about 20 m (65 ft) to the south of the house site. Its elevated position affords an excellent view of the swale opening onto the broad lower flat.

This terrace is not as well constructed as Site F3-12 [Site 50-80-02-2359]. The high facing is of roughly stacked lava boulders, but the floor is paved with angular cobbles, 50 to 10 cm (2 to 4 inches) in diameter. Overall, the structure measures approximately 20 m long across the face, 10 m wide from the rear of the floor to the foot of the facing, and 3.5 m high at the center (965 by 33 by 11 ft). The paved floor area measures 20 by 4 m (65 by 13 ft). No other surface evidence was observed at this site. [Davis 1981:15]

This site was not relocated during the Williams et al. (1995) survey and apparently was destroyed during the Kahuku Windfarm development. No records of archaeological mitigation have been found. If surface features or subsurface remains exist, they would be significant under NRHP criterion D for their information content, and the terrace structure could be of religious significance to modern Hawaiians.

3.2.2.7 Site 50-80-02-2501 Hanakoae Platform

Site 50-80-02-2501, Hanakoae Platform, was first identified by Airman Richard R. Skelaney and two companions, while hiking. He reported the find to the Bishop Museum, and on February 3, 1970, Bishop Museum Archaeologist Peter Chapman inspected the site. After clearing the Christmas-berry (*Schinus terebinthefolius*) overgrowth, Chapman was able to make a sketch and record a brief description. His field notes state:

Flat deck revealed, about 4 by 7 m, upslope about a meter off the ground, and downslope about 2.5 m above the surface. Farther down slope, possibly two earlier levels of construction remain beneath the rubble collapse. Firm clean and slightly bulging wall on up valley, south side; heavy well-made wall or facing on north side about 2.5 to 3 m high. Quite massive. No other structure reported nearby, about 3000 ft from stream bed. Suggest burial from massive quality and isolation, but could be agricultural heiau. [Chapman February 3, 1970, site notes]

Subsequently, the State Historic Preservation Office conducted a statewide archaeological inventory and nominated the site to the National Register of Historic Places (NRHP), and the site was accepted and listed on the NRHP on August 14, 1973. On the NRHP nomination form the site was described as a burial platform, with no reference to Chapman's notes that state that his functional interpretations were just suggestions. The structural form, location, and setting of this platform are consistent with other sites determined to be agricultural heiau. This, coupled with Chapman's indication that "further downslope, possibly two earlier levels of construction remain beneath the rubble collapse" (Chapman 1970) suggests this intact platform is but a portion of a larger site that is in deteriorated condition. The present functional designation for this platform is unconfirmed; further research at this site may help determine its actual function. This site is of traditional religious significance to modern Hawaiians. The detail of recording on the 1973 NRHP

Form is not consistent with today's standards and minimum requirements for site recording. This NRHP site should undergo archaeological inventory survey and recording.

3.2.2.8 Site 50-80-02-9506 Kea`aulu Ditch

Rosendahl (1977) identified and briefly recorded this site information:

Site 50-80-02-9506, Kea`aulu Ditch, [REDACTED] Stone-faced Irrigation Ditch, Historic Period origin [plantation irrigation?], poor condition, minimal significance potential, assigned to U.S. Army Treatment Category III.

Data recording was limited to the above description and a photograph. More detailed and complete recording of this site should be undertaken. Based on the recorded data, the site may be eligible for the NRHP under criterion D.

3.2.2.9 Site 50-80-02-9507 `O`io Stream Terrace (Agricultural Terrace?)

Rosendahl (1977) identified and briefly recorded the following site information:

Site 50-80-02-9507, Oio Stream Terrace, [REDACTED] Agricultural? terrace, Prehistoric or Historic Period origin undetermined, poor condition, minimal significance potential, assigned to U.S. Army Treatment Category III.

Data recording was limited to the above description and a photograph. More detailed and complete recording of this site should be undertaken. Based on the recorded data, the site is eligible for the NRHP under criterion D.

3.2.2.10 Site 50-80-02-9508 East `O`io Gulch Platform (Stepped Stone Platform)

During his survey, Rosendahl (1977) identified and briefly recorded this site information:

Site 50-80-02-9508, East Oio Gulch Platform, [REDACTED] Stepped Stone Platform, Prehistoric or Historic Period origin undetermined, poor condition, minimal significance potential, assigned to U.S. Army Treatment Category III.

Data recording was limited to the above description and a photograph. More detailed and complete recording of this site should be undertaken. Based on the recorded data, the site is eligible for the NRHP under criterion D.

3.2.2.11 Site 50-80-02-9509 `O`io Gulch Complex (Agricultural Terraces)

Rosendahl (1977) identified and briefly recorded this site information for `O`io Gulch Complex:

Site 50-80-02-9509, Oio Gulch Complex, [REDACTED] agricultural terraces, Prehistoric or Historic origin undetermined, Poor condition, minimal significance potential, assigned to U.S. Army Treatment Category III.

Data recording was limited to the above description and a photograph. More detailed and complete recording of this site should be undertaken. Based on the recorded data, the site is eligible for the NRHP under criterion D.

3.2.2.12 Site 50-80-02-9517 Kanealii Agricultural Structures (Irrigated Agricultural Terraces)

Site 50-80-02-9517, Kanealii agricultural terraces, were described by Handy (1940:88) and assigned a State Site number by Rosendahl (1977:Table 5):

Waialea. There is a small group of terraces formerly known as Kanealii, now abandoned for lack of water, around the house of Mrs. John Baker, just east of the Boy's Industrial School and inland of Kamehameha Highway. The large terraces now cultivated seaward of the Industrial School are of recent construction. [Handy 1940:88]

Rosendahl (1977:Table 5) indicates the temporal origin of these terraces is in question, and further indicates the site is destroyed. No maps or illustrations of this site are available. Further archaeological investigation in this area is warranted as remains of the site may still exist. If any remains of the site do exist, they may be eligible for the NRHP.

3.2.2.13 Site 50-80-02-4881 Octagonal Concrete Slab (Military)

Williams et al. (1995:57-58) identified and described this site (Figure 5) in the following manner:

This site is an octagonal concrete slab [REDACTED] [REDACTED] This site is located on a narrow ridge approximately 2.0 m from the edge of the gulch's eastern wall. The site is under a growth of ironwood, which is the dominant vegetation in the area. The vegetation in the immediate site area is comprised of predominantly vines and some isolated young Christmas berry. A north-south foot trail, about 2.0 m east of the feature, extends to the north edge of the ridge. Several rectangular-shaped fox-holes excavated for Army training are located in the surrounding area.

The concrete slab is octagonal in shape, and measures 4.15 m in diameter, and 0.17 m thick. There are eight small square holes corresponding to each of the eight appear [corners] to be post holes. Based on the size of these cavities, the structural posts were of 4"x 4" square wooden posts. A set of concrete stairs, two steps high, is located on the west side of the slab indicates that the structure was oriented at a westerly direction with its entrance towards the gulch. A concrete pedestal, measuring 0.37 m high and 0.40 m wide, is located in the middle of the feature. This site appears to have been the foundation for a ranging or targeting station.



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Site 50-80-02-4881 Octagonal Concrete Slab

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The octagonal concrete slab is likely to be a military observation post, although its association with World War II is not known. This site is not considered eligible for listing on the NRHP.

3.2.2.14 Site 50-80-02-4882 Military Bunker

This site was identified and described by Williams et al. (1995:58):

Site 4882 is a concrete bunker [REDACTED]

[REDACTED] This single feature is surrounded by a dense growth of *koa haole*, Christmas berry, with an undergrowth of dense grass and vines. The surrounding topography is very rugged and extremely rocky. A rock quarry on the slope, west of the bunker, was used in quarrying materials for the feature's floor.

The bunker is a concrete rectangular structure with cemented rock walls along the front (seaward side). These walls are mostly of cobbles with small boulders, a single rock wide and several courses high, with highest portion at the northwest corner. A wall similar to this forms the west wall of the bunker. A second sloping rock wall below the bunker serves as a supporting foundation for the upper wall.

The bunker measures 8.7 m by 4.5 m and is widest on the *makai* side. The floor is of quarried gravel. A semi-circular concrete curb is directly behind the doorway and a gun mounting platform is directly in front of it. The curb measures 0.15 m high and it extends the length of the feature's *makai* opening. There are three intact metal built-in ammo storage cabinets in the bunker. One of these is located near the northeast corner, and two are side-by-side near the southwest corner. These ammo cabinets are now rusting. Several metal rebars protrude out of the south wall directly behind the main opening. With the exception of some collapsed portions on west and the northwest walls, the feature is in very good condition.

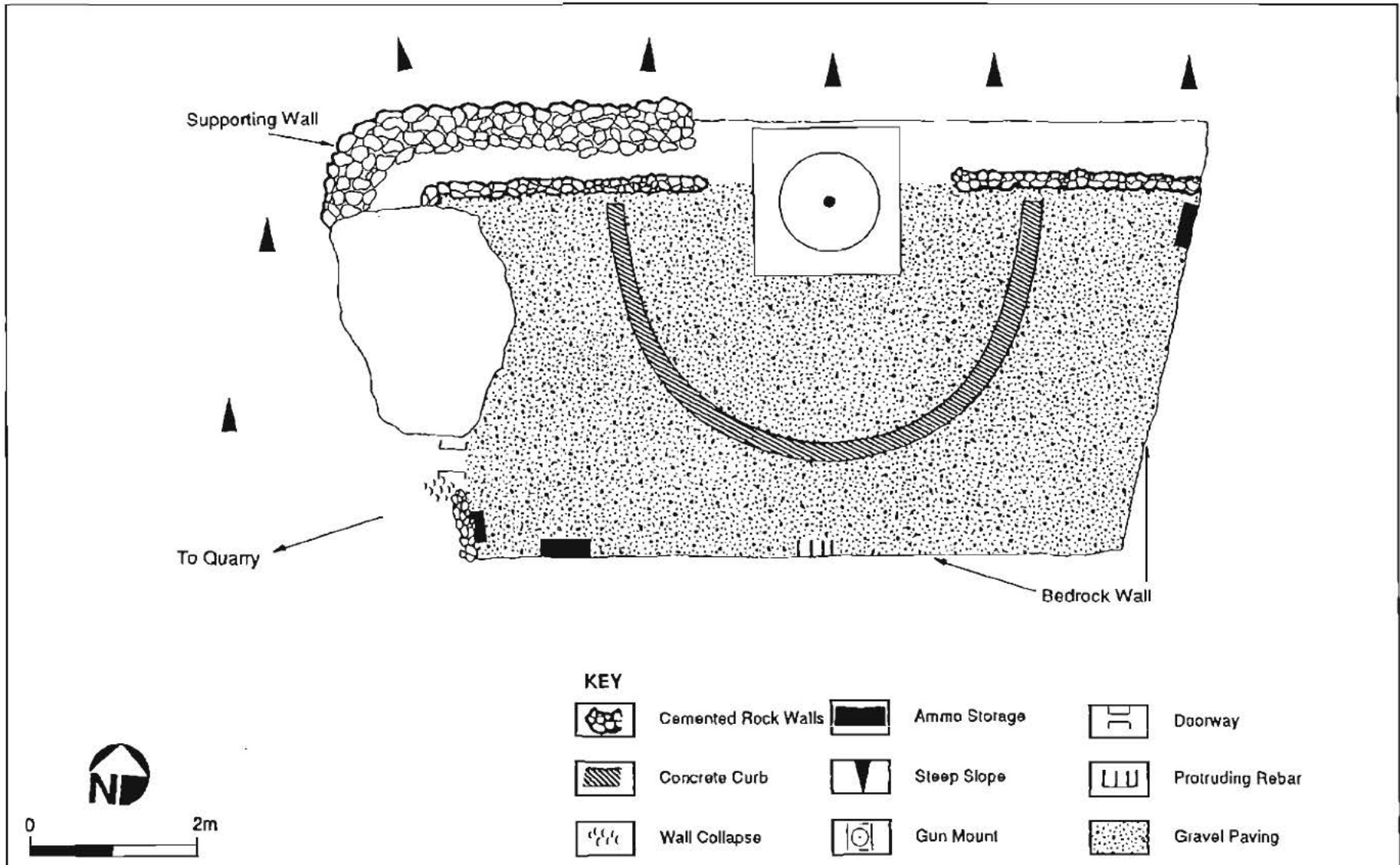
The bunker is associated with World War II era coastal defenses, and is significant under criteria A and D of the NRHP. This bunker is depicted in Figure 6.

3.2.2.15 Site 50-80-02-4883 Plantation-Era House Site

Williams et al. (1995:60-67) identified and described this Plantation-Era House Site in the following manner:

Site 4883 is a post-Contact residential site [REDACTED]

[REDACTED] Most of the features observed are still intact, although some have minor damage due to erosion. The site is currently under dense hau (*Hibiscus tiliaceus*) and Christmas berry.



There are fourteen features at the site. These include two walls, two small paved terraces, one small platform, two earthen depressions, one concrete paved terrace, two stone faced terraces, one U-shaped feature, two rock alignments, and one rock linear mound.

Site 4883 appears to be a plantation-era homestead, based on the architectural characteristics and surface artifacts present (Figure 7). It is significant under NRHP criterion D, as it is likely to yield information on the history of the area.

3.2.2.16 Site 50-80-02-4884 Imu (Cooking Hearth) Site

Williams et al. (1995:67-71) recorded this site, [REDACTED]

[REDACTED] The site is about half-way up on the gulch's north wall, on a steep slope dominated by ironwood, Christmas berry, strawberry guava, common guava, octopus trees, *ohia lehua*, ferns, and other species.

The site consists of a single *imu* (earth oven) on a small, circular man-made level area measuring 3.0 m in diameter. A single 0.5 m by 0.5 m was excavated at the site. It was estimated that only about a third of the feature was exposed. The *imu* is estimated to be about 1.0 m in diameter, based on the portion excavated.

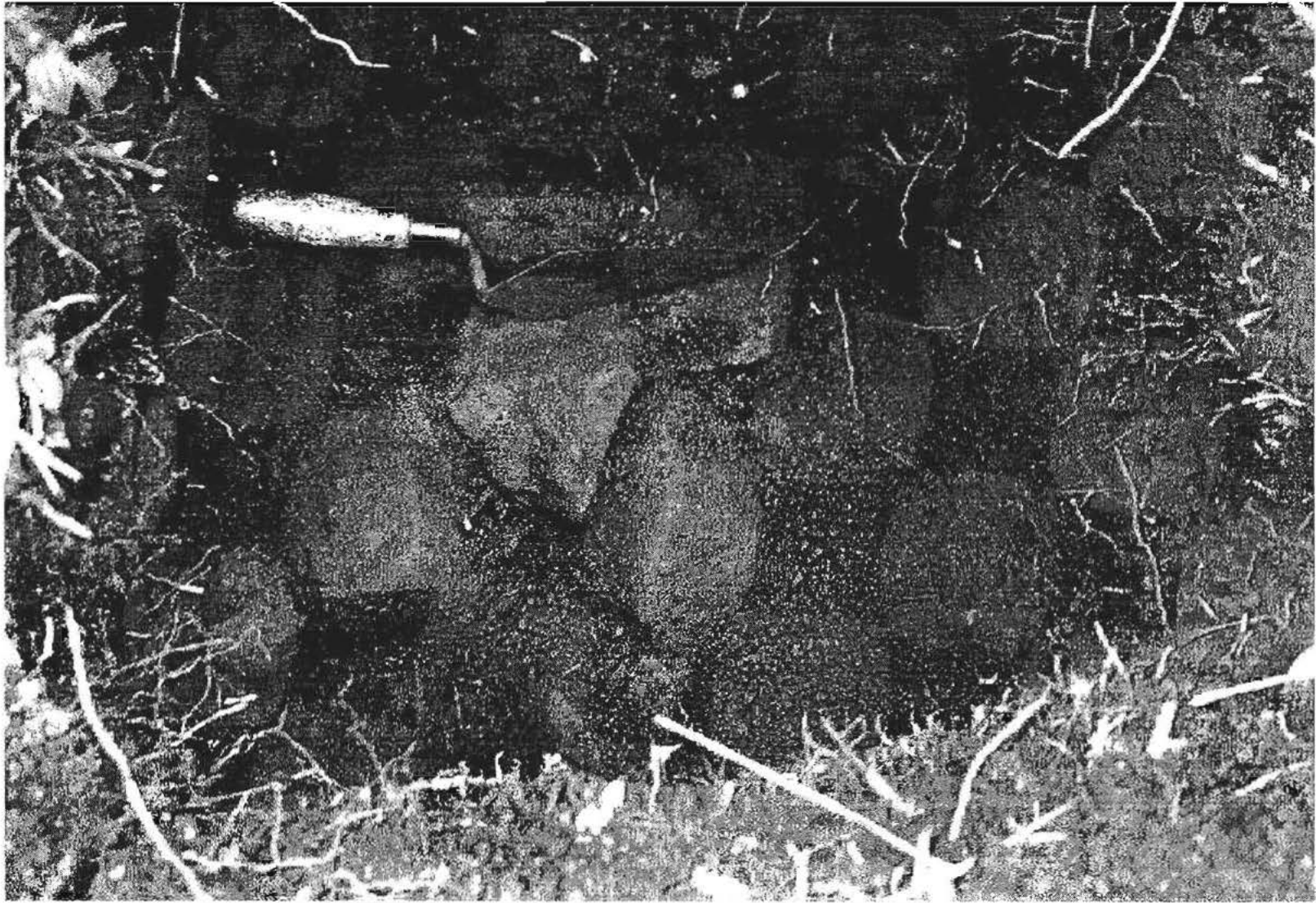
This site has been recorded, excavated, and radiocarbon and soils samples have been collected and analyzed, generating baseline site information. It should be noted, however, that this is one of the few sites found and studied in the upland area, and the extent of excavation was minimal. Additional subsurface resources may be present in the area. This site is significant under NRHP criterion D, because it has yielded and is likely to yield additional information about traditional Hawaiian activities in the area.

3.2.2.17 Site 50-80-02-4885 Pahipahialua Heiau

Williams et al. (1995:71-77) identified and described Pahipahialua Heiau in the following manner:

Site 4885 is a religious structure (*heiau*) [REDACTED]

[REDACTED] The site consists of a rock platform and several terraces on the upslope side of the platform (Figures 10-11). Several post-Contact features, including a concrete trough and a stone-lined ditch are located just *makai* (seaside) of the project boundary. These features are probably remnants from the plantation era, and were not recorded since they are outside the project area.



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Site 50-80-02-4884 Top of Imu

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The recording of the site focused primarily on the *heiau* platform. This feature measures 17.0 m long by 12.0 m wide, and is 1.4 m at its highest point. The feature is composed of subangular and subrounded large and small boulders, cobbles and some pebbles. Although the original architecture of the feature is difficult to discern, portions along north and the south sides show stacking. The rest of the feature has tumbled, probably due to disturbance by cattle and vegetation. An earthen pathway in the middle of the feature extends from the southeast end to approximately 2.5 m from the west end. There are two rock-lined depressions on north side of the pathway, in the central area of the *heiau*. A small platform, roughly 2.0 m on each side, is located at the northeast corner of the platform and is faced with subangular small boulders, with a pavement of waterworn gravels and pebbles. Branch coral fragments are scattered throughout the *heiau* platform, but more so along the north and southwest sides.

The *heiau* and associated terraces [REDACTED] is the most prominent pre-Contact site encountered during the Williams et al. (1995) reconnaissance survey. The unexpected discovery of the *heiau* [REDACTED] demonstrates better archaeological site preservation in the shoreward periphery of KTA than thought previously, especially along the foothills of the bluff. Most of this area, however, is located outside of the KTA. This site is significant under NRHP criteria A, C, and D. It is exemplary of traditional Hawaiian cultural occupation and architecture, and has yielded and is likely to yield information important to our understanding of traditional Hawaiian culture and prehistory. In addition, this site is a type that maintains strong traditional cultural value to modern Hawaiians.

3.2.2.18 Site 50-80-02-4886 Pentagonal Military Bunker

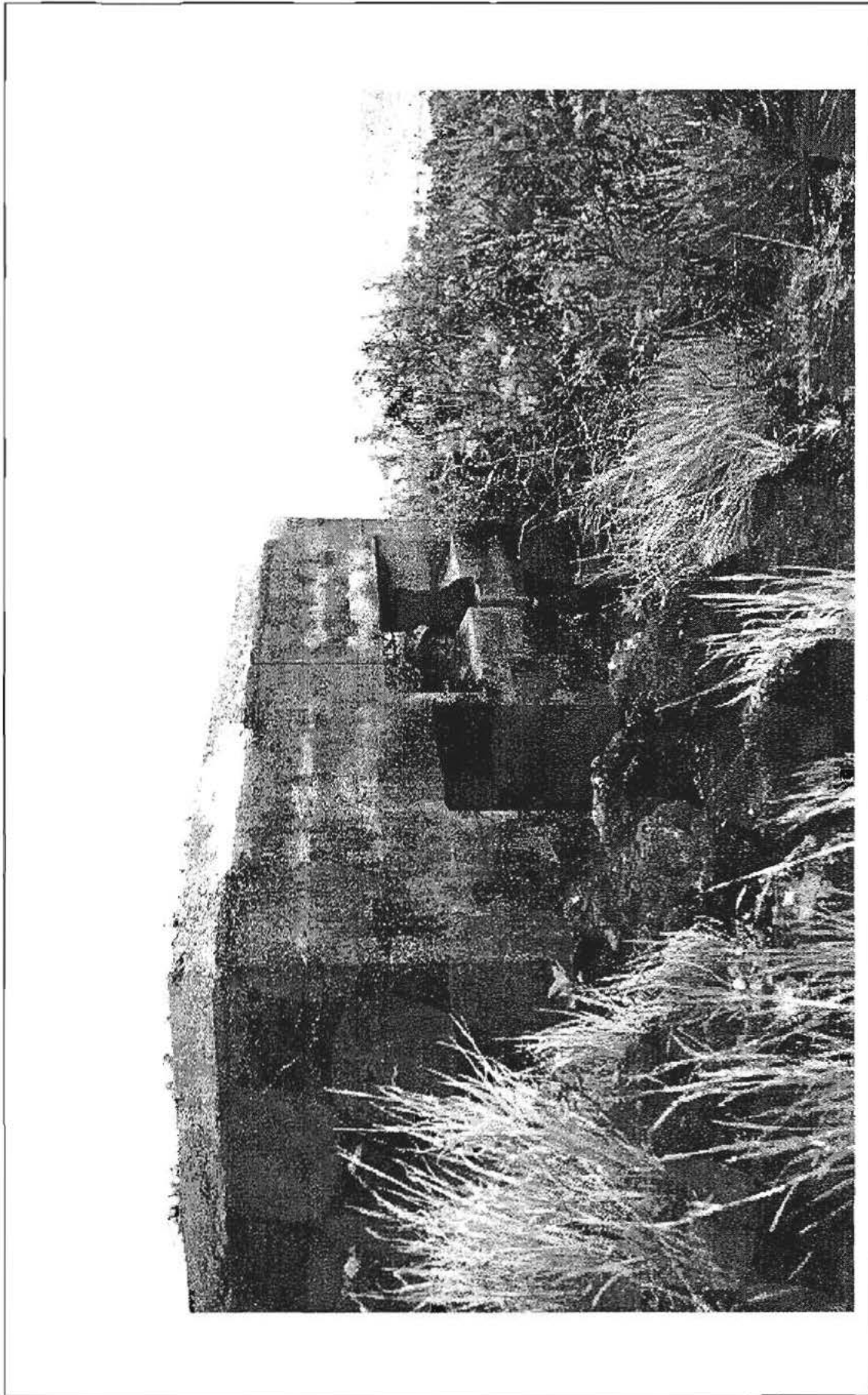
A Pentagonal Military Bunker was identified by Williams et al. (1995:77) and described below:

Site 4886 is a small (3.5 m by 3.0 m) five-sided World War II bunker [REDACTED]

[REDACTED] The bunker is in a circular pit that was excavated into the natural bedrock on top of the bluff. It is barricaded by the unexcavated bedrock. The roof of this feature is elevated just above the lowest portion of the pit.

The bunker has a single entry-way, and three windows. The door and one window are on the east side, and the other two windows are on either side of the V-shaped wall at the *makai* end. The door measures 1.23 m tall and 0.61 m wide. The interior measures 3.25 m by 2.45 m, and is 1.23 m high. The walls are 0.3 m thick. All the windows are cross-like in shape, and measure 0.91 m by 0.35 m at the widest points.

The bunker (Figures 12-13) is associated with World War II era coastal defenses, and is significant under NRHP criterion A and D for its association with the war and informational content.



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Site 50-80-02-4886 Pentagonal Military Bunker

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3.2.2.19 Site 50-80-02-4887 Habitation Complex With Related Agricultural Features

Williams et al. (1995:77, 80-84)) identified and described this Habitation Complex (Figure 14) as follows:

Site 4887 is [REDACTED]

The site is a complex of terraces and associated features [REDACTED]

[REDACTED] The site is on a rugged talus slope that consistently slopes towards the northwest. A narrow intermittent stream is located west of the terraces, and may have been the water source for these terraces.

A total of eleven features were recorded during the reconnaissance survey in the area. These include five terraces, one rock alignment, two circular alignment, one depression, one enclosure, and one boxed C-shape structure.

Site 4887 is interpreted to be a residential site, based on the features encountered, and probably dates to the pre-Contact or early post-Contact period. Concentrations of boulders are modified and are incorporated in the construction of most features. Feature 9 is thought to have been a house location. Feature 1 appears to be a ramp leading up to Feature 2, and eventually into Feature 9. Feature 8 is a possible animal pen based on its size and shape.

This site is significant under NRHP criterion D, because it has yielded and is likely to yield additional information about traditional Hawaiian activities in the area.

3.2.2.20 Site 50-80-02-4888 Earthen Depressions, Rock Alignment (Agricultural)

Williams et al. (1995:85) identified and described this site:

Several small depressions are present along the northwest slope, and a larger depression is located at the northeast end of the knoll. The smaller depressions measure 0.7 to 1.0 m in diameter, and 0.05 m or less deep. The larger depression measures 4.2 m long by 3.2 m wide, and it is about 0.5 m at its deepest point. A sizable charcoal scatter is present at the northeast side of the pit. This feature is thought to be an *imu*, but was not tested. The smaller depressions are suspected to have resulted from agricultural activities, most likely bananas. This assumption is based on the presence of banana trees nearby, and their similarity to features elsewhere in the island (Williams et al. 1995). A short boulder alignment (2.0 m long) at the edge of the false staghorn fern growth on the southwest slope is a possible slope retention.

Two 0.5 m by 0.5 m shovel probes were excavated in two of the smaller depressions to determine the presence or absence of cultural remains. The excavation was done following the natural stratigraphy and the excavated matrix was not screened. Both of the excavations revealed sparse charcoal flecking; none of the material was collected, and the units were terminated at 30 cmbs.

This site is significant under NRHP criterion D, as it is likely to yield information important to the history and prehistory of the area.

3.2.2.21 Site 50-80-02-4930 Linear Rock Mound (Undetermined Origin Or Function)

A Linear Rock Mound (Figure 15) of undetermined origin or function was identified by Williams et al. (1995:86, 87) and is described as follows:

Site 4930 is a linear rock mound or facing [REDACTED]
[REDACTED]
[REDACTED]

This single feature site is located directly east of the building and is covered with dense elephant grass (*Pennisetum purpureum*), *koa haole*, vines, and other weeds. The feature consists of roughly stacked, small, rounded to subrounded boulders and cobbles extending into a large dirt mound at the north end. This mound covers the north end of the feature. This feature measures 7.0 m long and 2.0 m at the widest point.

Given that the area has been greatly disturbed, it is impossible to ascertain site boundaries, functions, or site age. [REDACTED]
[REDACTED] Further work is necessary to determine this feature's function.

The function and temporal origin of this feature are currently unknown; further recording and testing would be required to determine these. Due to the potential the site has to be a pre-Contact feature, possibly associated with Pu'uaja Heiau. The site is significant under criterion D of the NRHP.

3.2.2.22 Site 50-80-02-0599 Punamano Communication Station

Site 50-80-02-0599 is the location of the former Punamano Communication Station. During archaeological reconnaissance of the area three World War II era bunkers in "excellent condition" were recorded by Farrell and Cleghorn (1995). Farrell and Cleghorn concluded that these bunkers are potentially eligible for inclusion in the National Register of Historic Places under Criteria A and C.

3.2.2.23 Site 50-80-02-9745 `Ōpana Mobile Radar Site

Site 50-80-02-9745, is the location of a former World War II era mobile radar station [REDACTED]. It is on the Hawaii Register of Historic Places (HRHP; 6/2/90), the NRHP (9/19/91), and is a NHL (4/19/94). This site is [REDACTED] is under U.S. Army jurisdiction. The `Ōpana Mobile Radar Station (Site 50-80-02-9745) played a critical role in the outbreak of the war. Located near Kahuku Point on the northern tip of O`ahu at 230 feet above sea level, the `Ōpana site was one of six Army radar stations established along O`ahu's coastline in the November 1941. While at the `Ōpana site on December 7, 1941 at 0702 hours, Privates Joseph L. Lockard and George E. Elliott observed more than fifty planes bearing down on the island from approximately 130 miles to the north. Within the hour, Japanese planes attacked Pearl Harbor, an event which plummeted the United States into war. `Ōpana is significant as the site where radar was utilized for the first time in a combat situation by the United States (U. S. Dept. of Interior 1991). The site is also significant because this tragic communication error prompted the development of more efficient early warning systems, including the eventual establishment of the U.S. Navy SATCOM Station near the former location of Site 50-80-02-9745.

It is important to note that Site 50-80-02-9745 is a landmark, and that there are no extant structural remains located there. This site is more or less a commemorative entity, designated because of the significance of events which occurred there and elsewhere on O`ahu on December 7th, 1941.

3.3 AREAS OF ARCHAEOLOGICAL PROBABILITY

Only a small percentage of Kahuku Training Area has undergone archaeological investigations to identify archaeological sites. Archaeological and historical resources may be present in areas that have not yet been surveyed. Based upon the results of previous archaeological investigations at Kahuku Training Area, settlement patterns, and historical references a model of probability for archaeological and historical resources is presented in Figure 16.

Areas which maintain a low probability for archaeological and historical resources at Kahuku Training Area would be portions of the training area which has been heavily impacted by either erosion or past destructive activities such as sugar cane cultivation. In such areas, it is unlikely that archaeological and historical resources exist.

Areas which maintain a moderate probability for archaeological and historical resources would be along the stream lined gulches and the lower cultivable flatlands. Archaeological sites expected in these areas would be associated with both irrigated and dryland agriculture, and either permanent or temporary habitation.

Areas which maintain a high probability for archaeological and historical resources would be those portions of Kahuku Training Area that are closest to the coast, and therefore, possibly contain permanent habitation deposits, and religious sites.

4.0 LAND USES, POTENTIAL THREATS, AND REGULATED ACTIVITIES

This section outlines how the land of KTA is utilized, and what activities pose potential and identified threats to archaeological and historical resources in the area.

4.1 LAND USES, USER GROUPS, AND AREAS

Of the 9,398 acres that comprise Kahuku Training Area, 25 acres are owned in fee, 18 acres in Easement, and the remainder of the area is leased. Two parcels of 7,850 and 355 acres are leased from the Campbell Estate. The remainder 1,150 acres are leased from the State of Hawaii.

4.1.1 Military Uses Of Kahuku Training Area

The Kahuku Training Area is used for tactical maneuver training, including mountain and jungle warfare with fixed and rotary wing aircraft. Of the 9,295 acres which comprise the Kahuku Training Area, only about 4,596 acres in the northern portion are considered suitable for maneuvers because of the rugged terrain in the southern areas. These areas are utilized for company sized units and smaller, but is considered marginal for battalion sized operations.

4.1.1.1 Restrictions in Kahuku Training Area

Restrictions to the training activities at Kahuku Training Area have been established by Range Control Hawaii. These restrictions are as follows:

- Only blank ammunition is allowed at KTA. Live fire, tracer ammunition, incendiaries, and explosives are prohibited.
- Pyrotechnics may be utilized if requested 30 days in advance of the training date, however aerial pyrotechnics are restricted.

- Excavation must be requested 30 days in advance of the training date.
- Portable latrines are required at a ratio of one latrine per 25 soldiers.
- Training activities are restricted within 150 meters of the wind turbines.

4.1.2 Non-Military Recreational Uses Of Kahuku Training Area

The Army has assigned alpha-numeric designations to all sections of KTA. These sections are indicated on Figures 2-3. Currently, sections of Area A1 and all of A3 are publicly utilized on holidays and weekends for recreational purposes. Pupukea Loop Trail in Section A3, and a motocross course at the *mauka* (toward the mountain) end of A1 are most commonly used.

4.2 IMPACTS AND POTENTIAL THREATS TO ARCHAEOLOGICAL AND HISTORICAL RESOURCES

This section provides information on the impacts, potential threats, and identified threats to archaeological and historical resources at Kahuku Training Area.

4.2.1 Potential Threats To Archaeological and Historical Resources

Potential threats to historic and cultural resources are generally characterized as any ground-disturbing or vegetation clearance activity such as the following:

1. Facilities development (site grading and improvements)
2. Underground utilities construction
3. Hazardous waste remediation
4. Insertion of utilities poles or posts
5. Vegetation grubbing
6. Landscaping
7. Unauthorized excavation of archaeological sites
8. Soil investigations
9. Operation of vehicles in unpaved areas (off-road vehicles)

10. Soil contamination
11. Recreational activities
12. Explosive detonation
13. Pedestrian human or animal activity

4.2.2 Identified Threats to Archaeological and Historical Resources

While all of the above activities pose potential threats to cultural resources at Kahuku Training Area, some specific threats to resources have been identified in the area.

The Kahuku Training Area has been subjected to various topographic alterations and modifications over the years. These included conversion of the traditional landscape (upland forest and dryland fields) to facilitate livestock pasturage, sugar, pineapple, and diversified plantation agriculture, and its current use as a training area by the U.S. Army.

4.2.2.1 Erosion

Numerous asphalt, gravel, and dirt roads traverse ridges and gulches throughout the project area. Foot trails, jeep trails, and fox holes are common features. Area A1 contains the most extensive road and trail system, as it is the focus of the most activity. Erosion in this part of KTA is very extensive. In addition to the issues under discussion, cattle are still roaming freely in the mid-section of Area C1. The ground cover in this area is depleted, thus opening it to erosion.

4.2.2.2 Off Road Vehicle Activity

The most destructive threat to archaeological and historical resources identified at Kahuku Training consisted of the use of motocross bikes and off road vehicles. During a brief site inspection evidence of off road vehicle usage was very apparent. This type of activity promotes erosion and damages both surface and subsurface archaeological deposits.

4.2.2.3 Unauthorized Excavation

The unauthorized excavation of archaeological sites is a serious problem. Once an archaeological site has been excavated, its potential to yield contextual information is destroyed. During a brief site visit, excavated (and unfilled) foxholes were observed. Some of these occurred in areas where there is a high probability for archaeological and historical resources to exist.

In addition to the excavation of numerous foxholes in Kahuku Training Area, excavated areas for latrine use were also observed during a brief site inspection. In these areas, holes had been excavated where human waste and toilet paper were deposited. The presence of human waste attracts feral animals, and evidence of further disturbance by such animal activity was apparent.

4.2.2.4 Removal of Basalt Stones

The utilization of basalt stones to create “hasty fortifications” was also observed. The removal of basalt stones from archaeological features is a very serious threat, may alter the site so completely that it will be unrecognizable. Some archaeological sites located at Kahuku Training Area (Pahipahialua Heiau) are comprised almost entirely of basalt. Removal of stones from such resources is extremely detrimental.

4.2.2.5 Litter Accumulation

Litter accumulation also presents a threat to archaeological and historical resources. The main source of litter observed at Kahuku Training Area consisted of MRE packaging. The mere presence litter serves to destroy the integrity of the site, but more destructive results are also possible. The presence of food packaging is attractive to feral animals especially to feral pigs whose rooting activities can be very destructive to archaeological sites.

4.2.2.6 Looting

During the Williams et al. study, evidence of looting in a rock shelter just outside the boundary of Kahuku Training Area was observed. While this particular incident did not occur within the Training Area boundaries, it is very likely that similar incidents have occurred within KTA itself. Looting is extremely detrimental to archaeological and historical resources, where archaeological context is destroyed and archaeological data are removed.

4.3 REGULATED ACTIVITIES AND EXEMPTIONS

4.3.1 Regulated Activities

As outlined in Sections 4.2.1 and 4.2.2, regulated activities at Kahuku Training area may pose a threat to archaeological and historical resources in the area. Actions that constitute these threats are as follows:

1. Military training activities including excavation (foxhole and latrine) in areas with known or potential archaeological resources.

2. Potential development of training facilities or infrastructure (including buildings, combat courses, roads, etc.) at Kahuku Training Area.
3. Recreational activities by non-military personnel granted weekend use of portions of Kahuku Training Area.

4.3.2 Routine Activities Exempted From Regulation

Certain routine activities do not pose potential threats to archaeological and historical resources at Kahuku Training area, and are therefore exempted from regulation. These routine activities include the following:

1. Any areas that have been previously landscaped may be maintained by basic landscaping maintenance such as tree trimming, grass mowing, etc.
2. Any areas that have been previously paved such as roads, parking areas, and paths may be repaved or resurfaced provided that heavy equipment is restricted to previously paved or disturbed areas.
3. Maintenance or repair to pre-existing military facilities, that are not historically significant, including buildings, water, sewer, telephone, gas, and electric utilities. These activities may be exempted providing that previously undisturbed areas are not disturbed in the process.

4.3.3 Waiver of Responsibilities Under Emergency Conditions

According to Department of Interior Regulations 36 CFR § 78, Federal Agency Responsibilities can be waived in whole or part in the event of a major natural disaster or an imminent threat to national security.

Major Natural Disaster means any hurricane, tornado, storm, flood, high water, tidal wave, earthquake, volcanic eruption, landslide, snowstorm, fire, explosion, or other catastrophe, in any part of the United States which, in the determination of a Federal Agency Head, causes damage of sufficient severity and magnitude such that an emergency action is necessary to the preservation of human life or property, and that such emergency action would be impeded if the Federal Agency were to concurrently meet its historic preservation responsibilities under section 110 of the National Historic Preservation Act, as amended.

Imminent Threat to the National Security means the imminence of any natural, technological, or other occurrence which, in determination of a Federal Agency

Head, because of its size or intent, seriously degrades or threatens the national security of the United States such that an emergency action would be impeded if the Federal Agency were to concurrently meet its historic preservation responsibilities under section 110 of the National Historic Preservation Act, as amended (36 CFR §78.2).

In the event of natural disaster or imminent threat to national security, the Commander of Kahuku Training Area shall forward information regarding the situation through Army Chain of Command to the Secretary of Defense:

1. The major natural disaster or imminent threat to the national security necessitating the waiver and the emergency action taken;
2. The period of effect of the waiver;
3. Which provisions of section 110 have been waived
4. The geographic area to which the waiver applies; and
5. The measures and procedures used to avoid or minimize harm to historic properties under the conditions necessitating the waiver (36 CFR §78.4)

Upon receiving the information, the Secretary of Defense must decide to waive Section 110 responsibilities as outlined in 36 CFR §78.3:

- (a) When a Federal Agency Head [Secretary of Defense] determines, under extraordinary circumstances, that there is an imminent threat of a major natural disaster or an imminent threat to the national security such that an emergency action is necessary to the preservation of human life or property, and that such emergency action would be impeded if the Federal Agency were to concurrently meet its historic preservation responsibilities under section 110 of the Act, that Federal Agency Head may immediately waive all or part of those responsibilities, subject to the procedures set forth herein and provided that the agency head implements such measures or procedures as are possible in the circumstances to avoid or minimize harm to historic properties.
- (b) Waiver under §78.3 (a) shall not exceed the period of time during which the emergency circumstances necessitating the waiver exist.
- (c) In no event shall a Federal Agency Head delay an emergency action necessary to the preservation of human life or property for the purpose of complying with the requirements in section 110 of the Act (36 CFR §78.3)

The Secretary of Defense shall then notify the Secretary of the Interior, within 12 days of the effective date of the waiver. The notification shall be in writing and should identify the following:

- 1) The major natural disaster or imminent threat to the national security necessitating the waiver and the emergency action taken;

- 2) The period of effect of the waiver;
- 3) Which provisions of section 110 have been waived
- 4) The geographic area to which the waiver applies; and
- 5) The measures and procedures used to avoid or minimize harm to historic properties under the conditions necessitating the waiver (36 CFR §78.4).

The Secretary of the Interior, will then review the waiver, as outlined in 36 CFR §78.5 below:

- (a) If the Secretary considers that all or part of the agency's decision as outlined under §78.4(a) is inconsistent with the intent of the Act or these regulations for use of the waiver under extraordinary circumstances, the Secretary shall notify the Agency Head and the Director of the office of Management and Budget within 5 days of receipt of the Federal Agency notice under §78.4(a) of termination of the waiver, or make appropriate recommendations for modifications of the waiver's use. Termination of a waiver by the Secretary is final.
- (b) If the waiver is still in effect at the time the Federal Agency Head receives recommendations from the Secretary, the Agency Head shall consider the recommendations and any comments received from the Advisory Council and the State Historic Preservation Officer before deciding whether to continue, withdraw, or modify the waiver. The Federal Agency Head shall respond to recommendations received from the Secretary either accepting or rejection those, recommendations, and where recommendations are rejected, explaining the reasons for such a decision. Information copies of such response shall be forwarded by the Federal Agency Head to the Advisory Council on Historic Preservation and the appropriate State Historic Preservation Officer.
- (c) If the waiver is no longer in effect at the time the Federal Agency Head receives recommendations from the Secretary or comments from the Advisory Council or the State Historic Preservation Officer, the Federal Agency Head should consider such recommendations and comments in similar future emergencies (36 CFR §78.5).

5.0 HISTORIC PRESERVATION ACTIVITIES

Historic preservation activities at Kahuku Training Area must include compliance with Section 106 and 110 procedures of the National Historic Preservation Act. This section outlines those procedures as well as the standards and qualifications for archaeological and architectural activities that must be adhered to.

5.1 SECTION 106 AND 110 COMPLIANCE PROCEDURES

The United States Army is responsible for initiation and completion of the Section 106 review process for a proposed undertaking. Section 106 and 110 compliance procedures follow five basic steps, including: identification and evaluation process, assessment of effects, consultation process, council comment, and procedure. Three alternative approaches also comply with Section 106 regulations.

5.1.1 Identification Process

The first step to Section 106 compliance is the identification process. Federal agencies are required by Section 106 of the National Historic Preservation Act to identify all historical properties that an undertaking may affect. This step requires consultation with the State Historic Preservation Officer and other sources that may be knowledgeable about the historical properties in the area, and a review of background information. This review will then determine what additional research or field work may be necessary, and proceeds to conduct such studies. Army Regulation 420-40 requires that:

Before planning any action or undertaking likely to have an effect on Army-controlled property, the DEH will determine whether any property listed, on the National Register exists within or near the area of the undertaking. If this information is not available, the DEH will locate, inventory, and evaluate all historic properties within the area of the undertaking, per paragraph 2-11 of this regulation, 36 CFR 60 and 63, and TM 5-801-1 (AR 420-40 1984:3-2)

5.1.2 Evaluation Process

The evaluation process involves the evaluation of districts, sites, buildings, structures, or objects that may be eligible for inclusion in the National Register of Historic Places but have not been included on the register, in reference to NRHP criteria for inclusion. This process must be carried out in consultation with the State Historic Preservation Officer (SHPO). If there are questions or disputes regarding the eligibility of a property, the agency can seek a formal determination of eligibility from the Secretary of the Interior. Army Regulation 420-40 outlines procedures for consultation with the SHPO. These are as follows:

The DEH will consult with the SHPO at the earliest stages of planning to coordinate all aspects of the review requirements, including the following:

- a. Methodology or research design of the projects to locate and inventory historic properties.

- b. Determining if recommendations of the SHPO can be accommodated in the project.
- c. Requesting the opinion of the Keeper of the National Register and the ACHP when the installation and the SHPO cannot agree on methods for locating, inventorying, and evaluating properties.
- d. Applying the criteria of the national Register to properties on the installation.
- e. Requesting a determination of eligibility from the Keeper of the National Register (per 36 CFR 63) when the installation and SHPO disagree on eligibility (AR 420-40 1984:3-3).

5.1.3 Assessment Of Effect Process

If properties that are included or eligible for inclusion in the National Register are discovered, the agency must then assess what potential effect the undertaking might have upon them. This process must be conducted under consultation with the State Historic Preservation Officer and other interested parties. The agency must utilize the criteria in the Council's regulations, in order to determine one of the following effects.

- (1) No effect: the undertaking will not affect historical properties;
- (2) No adverse effect: the undertaking will affect one or more historical properties, but will not be harmful;
- (3) Adverse effect: the undertaking will harm one or more historical properties.

Army Regulation 420-40 outlines the procedures to be followed for the Assessment of Effect. These are as follows:

5.1.3.1 Determination Of No Effect And No Adverse Effect

The DEH will apply the Criteria of Effect (36 CFR 800.3) to the proposed action or undertaking. If the installation finds that the undertaking will have no effect, it will send proof of this finding to the SHPO for comment. If the SHPO concurs, the installation will file the proof and the undertaking may proceed. In the case where there is an effect but it is not adverse, the DEH will forward a description of the proposed action and request the concurrence of the SHPO. If the SHPO concurs in the findings or if the SHPO fails to respond within 30 days, then the DEH will send a copy of this correspondence to the ACHP. The AG will send a copy of this correspondence through NGB-ARI-E to the ACHP. If the ACHP does not reply within 30 days, the action may proceed (AR 420-40 1984:3-4).

5.1.3.2 Objection

If the SHPO does not concur in the finding of no effect or of no adverse effect, the installation will consult again with the SHPO about conditions that may result in a

finding of no adverse effect before entering into the consultation process (AR 420-40 1984:3-5).

5.1.3.3 Determination Of Adverse Effect

If the installation finds that the proposed undertaking may have an adverse effect, or if the SHPO or ACHP does not concur in the determination of no adverse effect, the installation will do the following:

- a. Suspend any action that may result in an adverse effect on a National Register listed or eligible property.
- b. Suspend any action that prohibits looking at alternative ways to reduce adverse effects.
- c. Submit a preliminary case report or an acceptable mitigation plan to the ACHP for comment (AR 420-40 1984:3-6)

5.1.3.4 Preliminary Case Report

- a. The DEH will include the following in the preliminary case report:
 - (1) Documentation of the historic properties affected.
 - (2) An assessment of the effect of the action on those properties.
 - (3) A description of the measures considered to avoid or minimize the effect.
 - (4) A copy of the SHPO's comments on the effect.
- b. A draft EIS may contain the material of a preliminary case report when ACHP comments are requested per NHPA Sec 106 and 36 CFR 800 (AR 420-40 1984:3-7).

5.1.4 Consultation Process

A consultation process must be implemented if the undertaking has been determined to create an adverse effect. During the consultation process, the agency must consult the State Historic Preservation Officer and other interested parties in an effort to make the undertaking less detrimental to the historical property. Interested parties may include but are not limited to: local governments, Indian [Hawaiian] tribes, property owners, and other members of the public, and the Advisory Council. The goal of the consultation process in the creation of a Memorandum of Agreement (MOA), that will outline the agreed upon activities the agency will conduct in order to lessen, avoid, or mitigate the adverse effect the undertaking will have upon the resource. In certain cases the consulting parties may determine that the adverse effects are inevitable, but must be accepted in the public interest.

5.1.4.1 Avoiding Or Minimizing Adverse Effects

Army Regulation 420-40 has outlined options to avoid or minimize the potential adverse effect.

These are as follows:

- a. Alternative locations.
- b. Alternative undertakings.
- c. Limiting the size of the undertaking.
- d. Changing the proposed undertaking through redesign, redirection, or other similar changes.
- e. Improving the affected property through increased preservation and maintenance of the historic property during and after the undertaking.
- f. Documentation and recording of the historic property before the adverse effect occurs. This may be done by--
 - (1) Recovery and analysis of archaeological data.
 - (2) Photographic documentation, measured drawings, additional research.
 - (3) Preparation of a report for the public on the historic qualities of the property (AR 420-40 1984:3-9).

5.1.4.2 Documentation Standards

When an undertaking requires excessing, demolition, or substantial alteration of a historic property, documentation will be done in accordance with the standards and guidelines of the National Park Service for historic buildings and archaeological resources (AR 420-40 1984:3-10).

5.1.4.3 Memorandum Of Agreement (MOA)

- a. Consulting parties will prepare an MOA on how undertakings will be carried out if they agree on the following:
 - (1) Measures to avoid or mitigate the adverse effects.
 - (2) Acceptance of the adverse effect as being in the public interest.
- b. The MOA is signed by the ACHP executive director, the installation Commanding Officer, or AG, and the SHPO, and is forwarded through DA channels for ratification by HQDA (DAEN-ZCF-B).
- c. The DEH will make sure that any agreements that involve real estate used by the Reserve Components are staffed with the chief of the proper CONUS component.

- d. HQDA (DAEN-ZCF-B) will send approved agreements to the ACHP for final signature of the Chairman, ACHP, on behalf of the ACHP Council members (AR 420-40 1984:3-12).

If consultation does not result in a productive compromise, the agency, the State Historic Preservation Officer, or the Council may terminate the consultation. If this happens, the agency must submit the appropriate documentation to the Council and request written comment.

5.1.5 Council Comment

The Council can comment during the consultation process by participation in the consultation and signing the Memorandum of Agreement. If the Council did not participate in the consultation process, then the agency must submit the MOA to the Council for review and acceptance. The Council reserves the following options: to accept the MOA, request changes, or issue written comments. If the previous consultation procedures were terminated, then the Council issues written comments directly to the agency head.

Army Regulation 420-40 has outlined procedures for the Advisory Council comment. These are as follows:

If an agreement cannot be reached, the ACHP executive director has 15 days from the date of failure to agree to notify the ACHP chairman. The chairman has 15 days to--

- a. Refer the matter to a panel of not less than five council members, which will meet within 30 days. Within 15 days of meeting, the ACHP must send the comments to the President and the congress, and have them published in the Federal Register.
- b. Refer the matter to the full council which will meet within 30 days. Within 15 days of meeting, the ACHP must send its comments to the President and the Congress, and have them published in the Federal Register.
- c. Decline to refer the matter to either full council or to a council panel (AR 420-40 1984:3-13).

5.1.6 Proceed

If a Memorandum of Agreement has been created, then the agency proceeds with the undertaking following the terms of the Agreement. If a Memorandum of Agreement has not been created, then the agency should follow the Council's written comments in determining procedure.

5.1.6.1 Department of Defense Response

According to Army Regulation 420-40:

The NHPA requires the Secretary of Defense to take into account the ACHP's comment but is not required to abide by it. If the comment has been made by a panel and the decision is not to accept it, the Chairman, ACHP, may have the case presented to the full council. This must be done within 30 days. During this time the installation may not proceed with the undertaking. Compliance with the NHPA, section 106, has been accomplished when the Secretary of Defense has received and taken into account the council's comment (AR 420-40 1984:3-14).

5.1.7 Alternatives To Case-By-Case Review

There are also three alternative methods to Section 106 compliance. These are;

1. Programmatic Agreements among an agency, the Council, one or more SHPOs, and others;
2. Counterpart regulations developed by an agency and approved by the Council;
3. An agreement between the Council and a State, which substitutes a State review system for the standard Section 106 review process.

5.2 ARPA COMPLIANCE

The Archaeological Resources Protection Act (ARPA) requires federal agencies to establish a program to increase public awareness of the need to protect archaeological resources that are located on public lands (18 CFR 1312:20). In order to comply with this legislation the Base Historic Preservation Officer will implement an ARPA Notification and Public Benefits Program within one year following the approval of this historic preservation plan.

Military and non-military users of Kahuku Training Area shall be informed of ARPA regulations. This notification should include at least the following information as outlined in the Archaeological Resource Protection Act.

It is a Federal offense to excavate, remove, damage, or otherwise alter or deface, or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located at Kahuku Training Area. It is also a Federal offense to sell, purchase, exchange, transport, receive, or offer to sell, purchase, or exchange any archaeological resource if such resource was excavated or removed from Kahuku Training Area. Penalties for such offenses include a fine not greater than \$10,000 or one year imprisonment.

In addition, users of Kahuku Training Area shall be informed of the Federal offense for trafficking human skeletal remains as outlined in the Native American Graves Protection and Repatriation Acts.

The notification should also include information regarding procedures following the inadvertent discovery of archaeological resources. The activity which disturbed the archaeological resource shall cease immediately, all archaeological remains must be left in place, and the discovery should be reported to the Military Police.

These notifications should be made available to all military and non-military users of the installation.

Steps should also be taken to implement public awareness and appreciation programs regarding archaeological and historical resources. Such programs could include exhibits illustrating the history and archaeological importance of Kahuku Training Area, educational videos directed toward the users of KTA explaining the importance of the archaeological and historical resources, or the creation of a small handbook to be distributed to new personnel using Kahuku Training Area with an overview of Hawaiian culture, and the particular cultural resources and points of interest for the installation.

5.3 PERIODIC REPORTING TO SHPD AND ACHP OF INSTALLATION

As noted above the State Historic Preservation Division must be involved in the Section 106 and 110 compliance procedures. The State Historic Preservation Division and the ACHP should also receive the annual Historic Preservation Compliance Report summarizing all Historic Preservation activities at the installation.

5.4 STANDARDS FOR ARCHAEOLOGY AND HISTORIC PRESERVATION

In order to ensure protection of archaeological and historical resources, Federal standards and guidelines have been set. These standards include professional qualifications, and documentation standards for archaeologists and architects as well as curation standards for recovered materials.

5.4.1 Professional Qualification Standards For Archaeology

The professional qualification standards for archaeology have been outlined in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. These standards and guidelines comply with Section 110 of the National Historic Preservation Act and are as follows:

The minimum professional qualifications in archaeology are a graduate degree in archaeology, anthropology, or closely related field plus:

- (1) At least one year of full-time professional experience or equivalent specialized training in archaeological research, administration or management;
- (2) At least four months of supervised field and analytic experience in general North American [Hawaiian] archaeology;
- (3) Demonstrated ability to carry research to completion.

In addition to these minimum qualifications, a professional in prehistoric archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the prehistoric period. A professional in historic archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the historic period.

5.4.2 Documentation Standards And Guidelines For Archaeology

The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation also outlines the documentation standards and guidelines for archaeology, as presented below:

STANDARD I. Archaeological Documentation Activities Follow as Explicit Statement of Objectives and Methods That Responds to Needs Identified in the Planning Process

GUIDELINES

The research design should draw upon the preservation plan to identify:

- (1) Evaluated significance of the property(ies) to be studied;
- (2) Research problems or other issues relevant to the significance of the property;
- (3) Prior research on the topic and property type; and how the proposed documentation objectives are related to previous research and existing knowledge;
- (4) The amount and kinds of information (data) required to address the documentation objectives and to make reliable statements, including at what point information is redundant and documentation efforts have reached a point of diminishing returns;
- (5) Methods to be used to find the information; and
- (6) Relationship of the proposed archaeological investigation to anticipated historical or structural documentation, or other treatment.

STANDARD II. The Methods and Techniques of Archaeological Documentation are Selected to Obtain the Information Required by the Statement of Objectives

GUIDELINES

Investigation strategies should be selected based on these general principles, considering the following factors:

- (1) Specific data needs;
- (2) Time and funds available to secure the data; and
- (3) Relative cost efficiency of various strategies.

STANDARD III. The Results of Archaeological Documentation are Assessed Against the Statement of Objectives and Integrated into the Planning Process

GUIDELINES

The recovered data are assessed against the objectives to determine how they meet the specified planning needs. The utility of the method of approach and the particular techniques which were used in the investigation (i.e. the research design) should be assessed so that the objectives of future documentation efforts may be modified accordingly.

STANDARD IV. The Results of Archaeological Documentation are Reported and Made Available to the Public

GUIDELINES

Archaeological documentation concludes with written report(s) including minimally the following topics:

- (1) Description of the study area;
- (2) Relevant historical documentation/background research;
- (3) The research design;
- (4) The field studies as actually implemented, including and deviation from the research design and the reason for the changes;
- (5) All field observations;
- (6) Analyses and results, illustrated as appropriate with tables, charts, and graphs;
- (7) Evaluation of the investigation in terms of the goals and objectives of the investigation, including discussion of how well the needs dictated by the planning process were served;
- (8) Recommendations for updating the relevant historic contexts and planning goals and priorities, and generation of new or revised information needs;

- (9) Reference to related on-going or proposed treatment activities, such as structural documentation, stabilization, etc.; and
- (10) Information on the location of original data in the form of field notes, photographs, and other materials.

Archaeological Documentation can consist of Inventory Survey, Data Recovery, or Monitoring. The following are guidelines set forth for each level of documentation as outlined by the State of Hawai'i Department of Land and Natural Resources Title 13.

5.4.2.1 Inventory Survey

Archaeological survey is often required to identify and inventory any historical properties in a project area, including historical properties of traditional cultural value, in order to determine if significant historical properties are present. An inventory survey is not complete until:

1. Adequate procedures have been taken to determine if it is likely that historic properties are present in the area to be affected by the undertaking and, if so, to identify all historic properties.
2. Sufficient inventory information has been gathered to enable an evaluation of the significance of a historic property in accordance with significance criteria.

Five steps are required in an archaeological survey, as follows:

1. Historical Background Research.
2. Archaeological Background Research
3. The Archaeological Field Survey.
4. Oral Historical Research to Identify Culturally Significant Historic Properties.
5. The Archaeological Inventory Survey Report.

1. Historical Background

Historical research is required to identify the history of land use and historic property patterns at the *ahupua`a* level and at the project area level. The minimal requirements for historical background research are as follows;

- A. Check if Land Commission Awards (LCAs) were awarded within the *ahupua`a* and within the parcel to establish 1848-51 land use patterns.
- B. Search of earlier literature to establish prehistoric and early historic land use patterns.
- C. Search of later literature to establish post- 1850 land use patterns.
- D. Prepare predictive site maps for each period.

2. Archaeological Background Research.

It shall be determined if prior archaeological studies have occurred within the project parcel and within the *ahupua`a* in which the parcel is located. At a minimum, the SHPD shall be consulted. If studies have been done, the findings shall be reviewed. This review shall include the following, for both the *ahupua`a* and parcel levels of analysis:

- A. The extent of survey coverage.
- B. The thoroughness of survey coverage.
- C. The types of sites found (if any), and their numbers and distributions.
- D. The likely function of these sites.
- E. Dating (if any has been done).
- F. A summary of past land use patterns, revising those identified in the historical background research with the archaeological information to date.

3. Archaeological Field Survey

Portions of the project area that have not been sufficiently surveyed shall undergo archaeological inventory survey to determine whether historical properties are present and, if so, to establish their nature and locations.

- A. Areas which have no visible historic properties shall be evaluated to determine whether subsurface historic properties are present through test excavations.

- B. Historic properties, or features of properties, that have several possible alternative functions based on surface examination shall be test excavated to resolve the question of property, or feature function. If human skeletal remains are encountered, they shall not be disturbed, and excavations shall be backfilled.

4. Oral Historical Research to Identify Culturally Significant Historical Properties.

This step attempts to identify any historical properties of traditional cultural value in the project area. Identification shall involve consulting recorded oral traditions and interviewing persons knowledgeable of the undertaking's area. Findings must be presented in the Archaeological Inventory Survey Report.

5. Archaeological Inventory Survey Report.

To meet minimal standards the Archaeological Inventory Survey Report shall include the following:

1. Identification of the Survey Area:
 - a) On a map which clearly shows the parcel's position on the relevant U.S.G.S. STANDARD 1:24,000 topographic map.
 - b) Text, which states the island, district, *ahupua`a* and the Tax Map Key (TMK) and acreage of the parcel:
2. Identification of the owner(s) of the parcel:
3. A description of the parcel's environment, to include:
 - i) Topographic data (including general elevations, distance inland, and general terrain patterns).
 - ii) Vegetation data.
 - iii) Soil data.
 - iv) Rainfall information.

4. A section on historical background research which shall include:
 - i) Present findings on land use and site patterns for the ahupua`a and parcel for:
 - ii) Prehistoric and early historical times.
 - a) times, as indicated by LCA awards.
 - iii) Post-1850 times.
 - b) Summarize references reviewed.
 - c) For 1848-1851 times indicate:
 - i) Whether any Land Commission Awards were granted within the parcel and within the ahupua`a in which the parcel is located.
 - ii) If awards were granted, specify the number of awards, their LCA number, and locate the awards on a map.
 - d) Provide maps showing different land use and site predictions for each period.
5. The report shall contain a section on archaeological background research which shall include:
 - a) A review of whether any prior archaeological studies have occurred in the parcel and in the ahupua`a in which the parcel is located. As a minimum, it must be indicated that consultation with the State Historic Preservation Division took place to determine if such studies exist
 - b) If such studies have taken place, the report shall include;
 - i) A list of these studies, with report references.
 - ii) The areal extent of the survey coverage indicated on a map.
 - iii) The thoroughness of the survey coverage.

- iv) The types of sites found (if any), and their numbers and distributions.
 - v) The likely function of these sites.
 - vi) Dating (if any has been done).
 - vii) A revised summary of past land use patterns in the ahupua`a and the parcel based on the archaeological information to date.
6. The report shall contain a section on survey methods used in the archaeological field survey which shall include:
- a) Number of personnel, with the names and degrees of the Principal Investigator and Field Director.
 - b) When the survey was performed and the duration of time for the survey.
 - c) The extent of survey coverage. If the coverage was less than 100%, the rationale for the sample (the sampling design) must be presented in a careful argument. Sampling designs which included analysis of possible subsurface sites under sand dunes, urban fill, and the like must also be presented here.
 - d) The techniques used to identify sites (transects, sweeps, test excavations, augering, etc.).
 - e) The extent of historical property recording (mapping, measuring, photographing, test excavations) and the techniques used -- with the rationale for these techniques given.
 - f) The method used to plot site location.
7. Archaeological field survey findings. Each site found shall be individually described, as follows:
- a) A State site number and any previous numbers (including numbers placed on permanent markers at the sites).
 - b) A reference to a previous study, if the site has been recorded before.

- c) The site's formal type (e.g., C-shaped enclosure, platform, enclosure, wall, paving, etc.). If it has several major features, then each of these should be noted (e.g., 3 C-shaped enclosures, 1 platform, 4 stone cairns).
- d) A description of the site, to include:
 - i) Site size--horizontal extent.
 - ii) The major feature(s)'s shape, area, with representative architectural heights and widths, etc. (in metrics).
 - iii) The presence/absence of surface remains (artifacts, midden, debris, etc.). If present, the general nature of these remains, their density, and distribution.
 - iv) The presence/absence of any subsurface deposits. If present, an assessment of the general depth and nature of these remains. If test excavations, augering, etc. occurred, these results must be presented here and must include stratigraphic information with soil descriptions (with Munsell colors) and representative profiles.
 - v) Photographs.
 - vi) Plan maps; at a minimum, sketches to scale. Must include a bar scale, north arrow, and indicate method used (e.g., tape and pocket transit; transit, stadia rod, and tape; tape and compass; visual estimate; etc.)
 - vii) The condition of the site.
 - viii) An assessment of site function, with supportive arguments.
 - ix) An assessment of site age, with absolute dating results when available.
- e) If subsurface analysis occurred, findings must be presented under each site's description to include:
 - i) Stratigraphic layers, with soil descriptions (using Munsell colors) and representative profiles.

- ii) Descriptions of features, including provenience within layers.
- iii) Listing of artifacts, including provenience within layers.
- iv) Listing of faunal and botanical remains, by layer.
- v) Listing of debris and other remains, by layer.
- vi) Any processed radiocarbon and/or volcanic glass dates, by provenience.

8. Laboratory Analyses, to include:

- a) An overall presentation of artifacts, to include
 - i) A master list,
 - ii) Measurements of artifacts, which can be in table form and can be presented under the next item.
 - iii) Analysis by artifact types.
 - iv) Illustrations (line drawings and/or photographs) of a representative sample of artifacts.
- b) An overall presentation of faunal and botanical remains, to include
 - i) A master list, presenting the species within each layer of each site and their weights in grams.
 - ii) Analysis by species, as possible.
- c) An overall presentation of absolute dating, to include:
 - i) A master list, by site and by provenience within site, which includes laboratory numbers for each date.
 - ii) Methods of collection and lab treatment.
 - iii) For volcanic glass dates, a presentation of chemical source, ring measurements, and any induced hydration treatment.

- iv) For radiocarbon dates, C12/C13 ratios shall be obtained.
- v) Additional findings on the Research Problems previously studied in the Project Area.

9. References.

Location of depository (archive) for collections, photographs and written site records/maps to be presented in an appendix B.

5.4.2.2 Archaeological Data Recovery

Archaeological Data Recovery requires five basic steps;

1. Preparation of an Archaeological Data Recovery Plan.
2. Fieldwork called for by the Data Recovery Plan
3. Laboratory Work called for by the Data Recovery Plan
4. The Archaeological Data Recovery Report
5. Depositing (Archiving) the Recovered Archaeological materials.

1. Preparation of a Data Recovery Plan

An archaeological data recovery plan (research design) shall be prepared prior to the start of archaeological data recovery. This plan shall:

- A. Identify historic properties to be studied.
- B. Identify research questions to be addressed. This shall be done by reviewing prior archaeological and historical work in the parcel, *ahupua`a* and wider region. The specifics of these questions will vary with the extent of prior work.
- C. Identify specific data needed to address the questions,
- D. Identify methods to be used to acquire and analyze the data. Any sampling approaches to be used shall be noted here. The plan shall also use the most efficient methods to try to answer the research questions.

- E. Identify a procedure for depositing collections after conclusion of the data recovery project.
- F. If burials are to be disinterred as part of data recovery, the procedures of NAGPRA shall be followed.
- G. If properties with traditional cultural significance are involved, the consulting archaeologist shall consult with members of the relevant cultural group in the local community, to take into account any cultural concerns regarding data recovery fieldwork methods, thereby helping to make the fieldwork more sensitive to cultural concerns.
- H. This plan shall be reviewed and approved by the State Historic Preservation Division prior to the start of archaeological data recovery.

2. Fieldwork.

The fieldwork required in an archaeological data recovery project will vary from case to case. It shall be specified in the data recovery plan. It may include detailed mapping, surface collections, and excavations.

3. Laboratory Work.

Laboratory work will also vary from case to case but shall be specified in the data recovery plan. This work may include dating, faunal analyses (marine shell, tree snails, mammals, fish, amphibians), soil analyses, botanical analyses, artifact analyses, etc. If osteological analyses of human skeletal remains are undertaken they shall conform with NAGPRA.

4. Archaeological Data Recovery Report.

To meet minimal standards the Archaeological Data Recovery Report shall include the following:

1. Abstract. Identifying:
 - a) The sites studied.
 - b) General findings relevant to research questions;

2. Introduction, including the reasons for the project and the location of the Study Area to include:
 - a) A portion of the relevant U.S.G.S. standard 1:24,000 topographic map showing the *ahupua`a*, the parcel, and the areas studied.
 - b) Text, which states the island, district, *ahupua`a* and the Tax Map Key (TMK) of the parcel.
3. Research Problems. The research problems, test implications, and information needed to address the questions shall also be discussed here.
4. Archaeological field methods identifying:
 - a) Number of personnel, with the names and degrees of the Principal Investigator and Field Director.
 - b) When the work was done.
 - c) Methods planned in the Data Recovery Plan and any deviations, to include sampling strategies and specifics on techniques used.
5. Archaeological fieldwork. Each site studied shall be individually described, to include:
 - a) A State site number and any previous numbers (including numbers placed on permanent markers at the sites).
 - b) A reference to a previous study, if the site has been recorded before.
 - c) The site's formal type (e.g., C-shaped enclosure, platform, enclosure, wall, paving, etc.). If it has several major features, then each of these should be noted (e.g., 3 C-shaped enclosures, 1 platform, 4 stone cairns).
 - d) A description of the site, to include any of the following not recorded in previous studies:
 - i) Site size--horizontal extent.
 - ii) The major feature(s)'s shape, area, with representative architectural heights and widths, etc. (in metrics).

- iii) The presence/absence of surface remains (artifacts, midden, debris, etc.). If present, the general nature of these remains, their density, and distribution.
 - iv) The presence/absence of any subsurface deposits. If present, an assessment of the general depth and nature of these remains.
 - v) Photographs.
 - vi) Plan maps, at a minimum sketches to scale. Must include a bar scale, north arrow, and indicate method used (e.g., tape and pocket transit; transit, stadia rod, and tape; tape and compass; visual estimate; etc.)
 - vii) The condition of the site.
- e) If excavations, augering, etc. occurred, findings must be presented under each site's description to include:
- i) Stratigraphic layers, with U.S.G.S. soil descriptions (using Munsell colors) and representative profiles.
 - ii) Descriptions of features, including provenience within layers.
 - iii) Listing of artifacts, including provenience within layers.
 - iv) Listing of faunal and botanical remains, by layer.
 - v) Listing of debris and other remains, by layer.
 - vi) Any processed radiocarbon and/or volcanic glass dates, by provenience.
- f) An assessment of site function, with supportive arguments.
- g) An assessment of site age.
6. The Laboratory Analyses section of the report shall include:
- a) An overall presentation of artifacts, to include
 - i) A master list,

- ii) Measurements of artifacts, which can be in table form and can be presented under the next item.
 - iii) Analysis by artifact types.
 - iv) Illustrations (line drawings and/or photographs) of a representative sample of artifacts.
 - b) An overall presentation of faunal and botanical remains, to include
 - i) A master list, presenting the species within each layer of each site and their weights in grams.
 - ii) Analysis by species, as possible.
 - c) An overall presentation of absolute dating, to include:
 - i) A master list, by site and by provenience within site, which includes laboratory numbers for each date.
 - ii) Methods of collection and lab treatment.
 - iii) For volcanic glass dates, a presentation of chemical source, ring measurements, and any induced hydration treatment.
 - iv) For radiocarbon dates, C12/C13 ratios shall be obtained.
 - d) Osteological analyses, if human skeletal remains are found and are to be analyzed, to conform with NAGPRA regulations.
7. Additional findings on the Research Problems previously studied in the Project Area.
8. References.
9. Location of depository (archive) for collections, photographs and written site records/maps. To be presented in an appendix.

6. Final Disposition of Collections.

All collections from public lands shall be placed in an acceptable archive to be designated by the SHPD. Final disposition of any human skeletal remains and associated grave goods removed during data recovery work shall follow NAGPRA guidelines.

5.4.2.3 Archaeological Monitoring

Archaeological monitoring requires five basic steps;

1. Preparation of a monitoring plan.
2. Fieldwork.
3. Laboratory work, as relevant.
4. The monitoring report.
5. Archiving of collections, as relevant.

1. The Archaeological Monitoring Plan.

The archaeological monitoring plan shall be prepared, reviewed, and approved by the State Historic Preservation Division prior to the monitoring project. The plan shall contain the following information.

1. What kinds of remains are anticipated in historic properties.
2. Where in the construction area these properties are likely to be found.
3. How these properties will be treated. If properties with traditional cultural significance are involved, the consulting archaeologist shall consult with members of the relevant cultural group in the local community, and with OHA for any such native Hawaiian concerns regarding monitoring fieldwork methods, thereby helping to make the fieldwork more sensitive to cultural concerns.
4. A provision that the archaeologist conducting the monitoring has the authority to halt construction in the immediate area of a find, in order to carry-out the plan. Construction can shift to other areas in such a case.

5. Coordination meeting with the construction team and archaeologist, so the construction team is aware of the plan.
6. Likely laboratory work to be done. If osteological analyses of skeletal remains are expected, they shall conform with NAGPRA.
7. Report preparation.
8. Archiving of the collections.

2. Fieldwork

The fieldwork shall be specified in the monitoring plan and shall vary from case to case. It may include profile documentation of cultural layers' stratigraphy, photographs, excavation of exposed features, and collection of cultural or botanical samples.

3. Laboratory Work

Laboratory work shall occur, if archaeological artifacts and other remains are recovered. The nature of the work shall be specified in the monitoring plan.

4. Monitoring Report

The monitoring report shall include the following:

1. Abstract to include:
 - a) Any sites studied.
 - b) General findings.
2. Location of the Study Area to include:
 - a) A portion of the relevant U.S.G.S. STANDARD 1:24,000 topographic map showing the *ahupua`a*, the parcel, and the areas studied.
 - b) Text, which states the island, district, *ahupua`a* and the Tax Map Key (TMK) of the parcel.
3. Reason for the monitoring.

4. Archaeological field methods to include:
 - a) Number of personnel, with the names and degrees of the Principal Investigator and Field Director.
 - b) When the work was done.
 - c) Methods planned in the Monitoring Plan and any deviations, with explanations why. To include specifics on techniques used.

5. Archaeological fieldwork. Each site studied shall be individually described, to include:
 - a) A State site number and any previous numbers (including numbers placed on permanent markers at the sites).
 - b) A reference to a previous study, if the site has been recorded before.
 - c) The site's formal type (e.g., C-shaped enclosure, platform, enclosure, wall, paving, etc.). If it has several major features, then each of these should be noted (e.g., 3 C-shaped enclosures, 1 platform, 4 stone cairns).
 - d) A description of the site, to include any of the following not recorded in previous studies:
 - i) Site size--horizontal extent.
 - ii) The major feature(s)'s shape, area, with representative architectural heights and widths, etc. (in metrics).
 - iii) The presence/absence of surface remains (artifacts, midden, debris, etc.). If present, the general nature of these remains, their density and distribution.
 - iv) The presence/absence of any subsurface deposits. If present, an assessment of the general depth and nature of these remains.
 - v) Photographs.

- vi) Plan maps, at a minimum sketches to scale. Must include a bar scale, north arrow, and indicate method used (e.g., tape and pocket transit; transit, stadia rod, and tape; tape and compass; visual estimate; etc.)
 - vii) The condition of the site.
- e) If subsurface analysis occurred, findings must be presented under each site's description to include:
- i) Stratigraphic layers, with soil descriptions (using Munsell colors) and representative profiles.
 - ii) Descriptions of features, including provenience within layers.
 - iii) Listing of artifacts, including provenience within layers.
 - iv) Listing of faunal and botanical remains, by layer.
 - v) Listing of debris and other remains, by layer.
 - vi) Any processed radiocarbon and/or volcanic glass dates, by provenience.
- f) An assessment of site function, with supportive arguments.
- g) An assessment of site age.
6. Laboratory Analyses , to include:
- a) An overall presentation of artifacts, to include
 - i) A master list,
 - ii) Measurements of artifacts, which can be in table form and can be presented under the next item.
 - iii) Analysis by artifact-types.
 - iv) Illustrations (line drawings and/or photographs) of a representative sample of artifacts.
 - b) An overall presentation of faunal and botanical remains, to include

- i) A master list, presenting the species within each layer of each site and their weights in grams.
 - ii) Analysis by species, as possible.
- c) An overall presentation of absolute dating, to include:
 - i) A master list, by site and by provenience within site, which includes laboratory numbers for each date.
 - ii) Methods of collection and lab treatment.
 - iii) For volcanic glass dates, a presentation of chemical source, ring measurements, and any induced hydration treatment.
 - iv) For radiocarbon dates, C12/C13 ratios shall be obtained.
- d) Osteological analyses, if human skeletal remains are found and are to be analyzed, to conform with NAGPRA regulations.

- 7. Additional findings on the Research Problems previously studied in the Project Area.
- 8. References.
- 9. Location of depository (archive) for collections, photographs and written site records/maps. To be presented in an appendix.

5.4.3 Curation Standards

All archaeological data and materials resulting from an archaeological investigation must be curated. The Secretary of the Interior's Standards and Guidelines for Archaeology presents the standards for curation of such materials as follows:

- 1. Curation facilities have adequate space, facilities, and professional personnel;
- 2. Archaeological specimens are maintained so that their information values are not lost through deterioration, and records are maintained to a professional archival standard;

3. Curated collections are accessible to qualified researchers within a reasonable time of having been requested; and
4. Collections are available for interpretative purposes, subject to reasonable security precautions.

5.5 NATIVE HAWAIIAN COORDINATION, BURIAL PROTECTION, AND NAGPRA INVENTORY REQUIREMENT

The Native American Graves Protection and Repatriation Act was established to ensure consultation with Native groups regarding such sensitive issues as excavation of human burials, sacred objects, or objects of cultural patrimony. The act also provides for burial protection and requires that all Federal agencies conduct an inventory of previously excavated human remains on Federal lands.

5.5.1 Native Hawaiian Coordination

Native Hawaiians and Native Hawaiian Organizations must be consulted about issues concerning human remains, sacred objects, or objects of cultural patrimony discovered on Federal lands. According to the Native American Grave Protection and Repatriation Act, a "Native Hawaiian" is "Any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawai'i."

A Native Hawaiian Organization is any organization which;

1. serves and represents the interests of Native Hawaiians, services to Native Hawaiians, and
2. has as a primary and stated purpose the provision of services to Native Hawaiians, and
3. has expertise in Native Hawaiian Affairs, and shall include the Office of Hawaiian Affairs and *Hui Malama I Na Kupuna O Hawai'i Nei*.

The Office of Hawaiian Affairs was established by the constitution of the State of Hawai'i. *Hui Malama I Na Kupuna O Hawai'i Nei* is a nonprofit Native Hawaiian organization incorporated in 1989 to provide cultural guidance and expertise in cultural issues, especially those pertaining to human remains.

5.5.2 Burial Protection

The Native American Graves and Repatriation Act has established penalties for the illegal excavation and trafficking of Native Hawaiian human remains and sacred objects. In order to protect Hawaiian burials located at Kahuku Training Area from illegal excavation, vandalism, and desecration, military and non-military personnel of KTA shall be informed of NAGPRA penalties. In addition, Law enforcement personnel shall be informed of NAGPRA guidelines and trained in ARPA enforcement. Emergency Discovery Procedures (Section 6.5) shall be conducted in the case of inadvertent discoveries of human remains during archaeological, construction, or maintenance activities.

5.5.3 Burial Treatment Policy

Consultation with Native Hawaiians and Native Hawaiian Organizations such as the Office of Hawaiian Affairs and *Hui Malama I Na Kupuna O Hawai'i Nei* regarding burial discoveries should result in a Burial Treatment Plan. In the absence of such a plan, burial treatment should follow the following guidelines.

1. Human remains and funerary objects will not be disturbed or excavated unless threatened by imminent destruction by erosion or construction activities.
2. When excavation of human remains is necessary, it is to be conducted with dignity and respect, by trained personnel following proper archaeological method. Steps should be taken to protect the remains from the elements such as sun and rain, and vandalism. Excavation should strive toward 100% recovery of the remains whenever possible. Ownership of the remains and funerary objects shall be determined following NAGPRA policy.
3. After disinterment, non-damaging osteological analysis shall be conducted to address scientific research topics.
4. When osteological analysis is objected to by interested parties, and the necessity of the study can not justifiably surpass the necessity for respect for Hawaiian culture, the remains will be repatriated without analysis.

The Native American Graves and Repatriation Act is in the process of issuing implementing regulations regarding burial treatment. When these implementing regulations are complete, this burial treatment policy must be reviewed and revised to comply with NAGPRA regulations.

5.5.4 NAGPRA Inventory Requirement

The Native American Grave Protection and Repatriation Act requires each Federal agency to complete an inventory of Native American human remains and associated funerary objects within their possession by January 1, 1995. Requirements for this inventory are outlined in NAGPRA and are presented below;

1. The inventories and identifications required under subsection (a) shall be--
 - a) completed in consultation with tribal government and Native Hawaiian organization officials and traditional religious leaders;
 - b) completed by not later than the date that is 5 years after the date of enactment of this Act, and
 - c) made available both during the time they are being conducted and afterward to review committee established under section 8.
2. Upon request by an Indian tribe or Native Hawaiian organization which receives or should have received notice, a museum or Federal agency shall supply additional available documentation to supplement the information required by subsection (a) of this section. The term "documentation" means a summary of existing museum or Federal agency records, including inventories or catalogues, relevant studies, or other pertinent data for the limited purpose of determining the geographical origin, cultural affiliation, and basic facts surrounding acquisition and accession of Native American human remains and associated funerary objects subject to this section. Such term does not mean, and this Act shall not be construed to be an authorization for, the initiation of new scientific studies of such remains and associated funerary objects or other means of acquiring or preserving additional scientific information from such remains and objects.

6.0 SUMMARY OF RECOMMENDATIONS

In order to protect the archaeological and historical resources at Kahuku Training Area steps must be taken to reduce the identified threats and ensure that the potential threats to such resources do not occur. The following summarizes the general recommendations for protecting the archaeological and historical resources at KTA.

1. The archaeological and historical resources at Kahuku Training Area must be identified through further investigations. The results of these investigations should be utilized to revise and refine the areas of probability for archaeological and historical resources.

2. Off road vehicle usage should be restricted from areas of moderate to high probability for archaeological and historical resources.
3. Training activities at Kahuku Training Area should be restricted to activities that will not damage archaeological and historical resources.
4. Litter and human waste must not be allowed to accumulate at Kahuku Training Area.

6.1 GENERAL IMPLEMENTATION PLAN

1. In order to identify the cultural resources present at Kahuku Training Area further archaeological survey with subsurface testing (as defined by State and Federal standards) should be conducted at Kahuku Training Area by a qualified archaeologist (as defined by State and Federal standards). The results of these surveys should be utilized to assign significance to identified resources, to revise and refine the areas of probability for archaeological and historical resources located at Kahuku Training Area, and to offer further recommendations for protection of identified resources.
2. Off road vehicle usage should be strictly prohibited in areas of either moderate or high probability for archaeological and historical resources. Motocross activities should be conducted only in the designated areas (A1). Signs prohibiting the use of unauthorized vehicles in the Kahuku Training Area should be posted. The signs should inform the potential public users of the restrictions and penalties regarding historic and cultural resources (ARPA 1979). Periodic monitoring of Kahuku Training Area for destruction by unauthorized vehicles should be conducted by military police. Subsequent enforcement of laws prohibiting all such illegal activities should occur.
3. Training activities should be restricted in the areas of high and moderate probability for archaeological and historical resources in such a way so that the activities will not damage potential archaeological sites. In high and moderate probability areas the excavation of foxholes, latrines and the use of basalt stones to construct "hasty fortifications" should be prohibited.

It should be noted that the high and moderate probability areas at Kahuku Training Area will likely be reduced after further archaeological inventory level surveys with subsurface testing are conducted and archaeological sites are identified. Areas that produce negative results can be downgraded to either moderate or low probability areas once it has been demonstrated that few or no archaeological and historical resources exist in an area.

4. Efforts to control litter at Kahuku Training Area should be increased. Procedures to police and clean up the area after training activities have been conducted should be increased and strictly adhered to. MRE packaging, spent blank ammunition, and military hardware should all be removed from the reservation at the close of the training activities.

Portable latrines located in the Training Area should be utilized over the excavation of latrines during training activities. The excavation of individual latrines should be strictly prohibited.

In addition, periodic scheduled clean up procedures should be conducted at Kahuku Training Area to remove litter that may have been overlooked after training exercises as well as litter that may have accumulated from non-military users of the area.

5. Undertakings at Kahuku Training Area that pose potential threats (section 3.5.2) to archaeological and historical resources should follow Standard Operating Procedures to ensure that resources are not adversely affected by the undertaking.

6.2 STANDARD OPERATION PROCEDURES FOR MANAGERS, PLANNERS, AND USER GROUPS

The following is the Standard Operating Procedures (SOP) to be followed by user groups at Kahuku Training Area, to ensure protection of archaeological and historical resources.

6.2.1 SOP For Facilities Development

Construction and development of facilities at KTA pose a threat to archaeological and historical resources. The following Standard Operating Procedures are outlined to eliminate such threats.

To assure preservation of these resources, all development or construction which involves ground disturbing activities are to abide by the following general guidelines.

1. Construction projects that occur in Low Probability Areas (Figure 16), and which involve ground disturbing activities, should be aware of, and be prepared to follow the Emergency Discovery Procedures outlined in Section 6.2.5.
2. Construction projects that occur in Moderate Probability Areas (Figure 16), and which involve ground disturbing activities shall secure an archaeological monitor during construction excavation activities. The archaeological monitoring activities shall conform to the standards and guidelines of archaeological monitoring outlined in Section 5.4.2.3.
3. Construction projects that occur in High Probability Areas (Figure 16), and which involve ground disturbing activities, require archaeological inventory survey and subsurface testing prior to any construction activities. Archaeological inventory survey methods shall conform the standards and guidelines for inventory survey outlined in Section 5.4.2.1

6.2.2 SOP For Facilities Maintenance Projects

Routine and emergency facilities maintenance projects can also potentially threaten archaeological and historical resources at KTA. To ensure preservation of these resources the following Standard Operating Procedures must be followed.

6.2.2.1 Archaeological Resources

Since most of the archaeological and pre-military historical resources at KTA are not located in maintained areas or facilities, facilities maintenance will not for the most part affect such resources. However, maintenance personnel should be aware of the Emergency Discovery Procedures outlined in Section 6.2.5.

6.2.2.2 Architectural Resources

To date, no architectural evaluation of the buildings at KTA has been undertaken, and so it is uncertain if historically significant structures are present at the installation. If any structures are determined to be historically significant in the future, any projects affecting a historical architectural resource should follow the Secretary of Interior's Standard and Guidelines for Rehabilitation. The Standards are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall be not undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

One of the major threats to historic architectural resources is neglect, which can cause irreparable damage to historical materials. To preserve historic architectural resources, they must be maintained in an appropriate manner to avoid deterioration of and damage to the historical materials. Maintenance includes, but is not limited to, cleaning, painting, removal of potentially

damaging plants, and periodic replacement of water removal systems, such as gutters, downspouts, and drains.

While structures require routine maintenance and upkeep, standard material replacement, refurbishment, or repairs must conform with the established historical materials and style of each structure. Even seemingly minor changes in material can significantly alter a building's historical appearance. Also, if chemically incompatible materials are added they can cause damage to the structure. If unscheduled maintenance must occur before the SHPD can be notified, the work should be temporary and removable in case the work does not conform to SHPD's requirements.

The historic architectural qualities of historical buildings must be preserved. Care must be taken to maintain the historic architectural details, signage, materials, and elements such as window and door types of the structures. Where changes to materials must be made, the changes shall be "in-kind"; that is, materials identical to the original.

There are many resources available for guidelines to materials preservation, that include recommended cleaning methods, repair methods, maintenance programs and preservation approaches. These resources include, but are not limited to:

1. *Cyclical Maintenance for Historic Buildings*. J. Henry Chambers, AIA; National Park Service, U.S. Department of the Interior, 1976.
2. Preservation Briefs for various materials, published by the Preservation Assistance Division of the National Park Service, 1982.
3. *Architectural Graphic Standards*, Chapter 19: Historic Preservation. John Ray Hoke Jr., AIA and the American Institute of Architects; John Wiley & Sons, New York, 1988.
4. Historic Preservation Maintenance Procedures Technical Manual. TM 5-801-2, HQ, Department of the Army, Washington D.C., February 1977.

6.2.3 SOP Recreation And Public Access

Archaeological and historical resources can be threatened by public misuse, vandalism, or illegal excavation. The following are the Standard Operating Procedures for recreation and public access of Kahuku Training Area.

6.2.3.1 ARPA/NAGPRA Notifications

Public users of KTA should be made aware of the Archaeological Resource Protection Act of 1979 (ARPA) and the Native American Graves Protection Act of 1990 (NAGPRA) and the penalties applied for each. Public users of the installation should also be made aware of the procedures for reporting an Emergency Discovery of archaeological remains. These notices should be posted in public areas, and should include at least the following information:

Any person who attempts to excavate, remove, damage, or otherwise alter or deface any archaeological resources located at Kahuku Training Area will be committing a federal offense and subject to a fine of \$10,000 or one year imprisonment. In addition, attempts to sell, purchase, transport, or receive any archaeological resources which were excavated or removed from KTA are punishable by the same law (Archaeological Resources Protection Act.)

The discovery of any human skeletal material at Kahuku Training Area must be reported to military police, and all activities in the area must cease immediately. It is a felony offense for any person to attempt to, or to sell, purchase, use for profit, or transport for sale or profit the human remains of Native Hawaiians (Native American Graves Protection and Repatriation Act.) These laws will be enforced by military police. Any archaeological remains discovered at KTA must be left in place and the find reported to the military police.

In addition to posted notices, this information could also be contained in an informational brochure and made available to public users of Kahuku Training Area.

6.2.3.2 Historic Preservation Awareness Programs

The Army shall create and promote Public Awareness Programs to increase public awareness of the importance of protecting archaeological and historical resources at Kahuku Training Area. The Public Awareness Program could incorporate an number of media and activities that would serve to meet this end. Examples of interpretive programs that could be incorporated into the Kahuku Training Area Historic Preservation Awareness Program include the following:

1. Presentations and seminars on historic preservation and historic properties at KTA;
2. Historic property restoration and maintenance programs involving public interest groups;
3. Tours of the designated historic properties;
4. Designation of historic property locations on installation maps;

5. Placement and maintenance of signs or markers in visible locations at the historic properties;
6. Informational brochures made available to the public;
7. Field trips, essay or art contests for students from local schools, designed to teach students about the archaeological and historical resources in their community;
8. Interpretative exhibits or displays.

6.2.3.3 Cultural Resource Use Permits.

Cultural Resource Use Permits (ENG Form 4922-R) will be issued by the Installation Historic Preservation Officer to authorized any scientific study concerning cultural resources that is to be conducted outside of official agency duties under the direction of the Army. The study shall be consistent with the provisions of the Antiquity Act of 1906, ARPA, and 32 CFR 229. The Installation Historic Preservation Officer at KTA will review the permits, and will recommend permit approval or denial on a case by case basis to the Garrison. Permit applicants must meet the Secretary of the Interior's professional qualifications for archaeology.

The Installation Historic Preservation Officer shall notify any interested Native Hawaiians who may consider the site in question as culturally or religiously important, at least 30 days in advance of the study. Should interested Native Hawaiian parties have concerns regarding the study, the Installation Commander and/or Installation Historic Preservation Officer shall meet with the interested parties to discuss their concerns, and possible mitigation measures. Any mitigation measures adopted shall be incorporated into the Cultural Resources Use Permit. The Installation Historic Preservation Officer will be responsible to monitor activities to assure compliance with the terms of the permit (Eidsness et al. 1995:79).

6.2.3.4 Monitoring and Law Enforcement

In order to be effective, the installation security personnel shall be informed of ARPA and NAGPRA regulations and enforcement procedures. Law enforcement personnel shall periodically monitor public activities in site vicinities at Kahuku Training Area for destruction, vandalism or illegal excavations of archaeological sites and subsequently enforce all legal action against such activities.

In addition, law enforcement personnel should undergo cultural resources sensitivity and law enforcement training. The Installation Historic Preservation Officer is responsible for conducting

cultural resources sensitivity training for law enforcement personnel at KTA on an annual basis. The Installation Historic Preservation Officer shall also ensure that at least one law enforcement person at KTA have ARPA enforcement training, or an ARPA trained law enforcement person should be acquired by KTA through interagency agreement.

Information regarding ARPA enforcement training can be obtained by contacting the National Park Service, Employee Development Division, P.O. Box 37127, Room 3413, Washington, D.C. 20013-7127 (Eidsness et al. 1995:61).

6.2.3.5 Reporting.

The Installation Historic Preservation Officer for Kahuku Training Area shall prepare an annual Historic Preservation Compliance Report to be submitted to the State Historic Preservation Officer (SHPO) and staff at the State Historic Preservation Division (SHPD). These annual reports shall include the following information:

1. statement of purpose;
2. summary of cultural resources management actions (undertakings requiring Section 106 coordination, management oriented studies or actions, monitoring efforts, and major new findings;
3. Cultural Resources Use Permits (including number of applications, summary and status of permitted projects);
4. emergency discoveries and a report of damages to archaeological and historical resources;
5. Public Notification (ARPA/NAGPRA) and Benefits program (interpretation or other efforts; reports distributed to public libraries);
6. staff training accomplishments; and
7. management summary and recommendations (expected changes in land-use necessitating modification to HPP; major up-coming projects; and recommendations regarding staffing or equipment needs, procedures, etc.)[Eidsness et al. 1995:84]

6.2.4 SOP For Permits, Leases, and Contracts

Any permits, leases, contracts, easements, or other legal agreements between the Army and other military branches, government agencies, businesses, organizations, or individuals shall include the following information:

- 1) Archaeological Resource Protection Act and Native American Graves Protection and Repatriation Act Notification outlined in Section 6.2.3.1.
- 2) Procedures for Emergency Discovery of archaeological resources outlined in Section 6.2.5.
- 3) Section 106 compliance procedures in coordination with the Installation Historic Preservation Officer prior to any activity that may affect archaeological or historical resources.

All actions relating to cultural resource management involving permits, leases, and contracts shall be summarized in the annual Historic Preservation Compliance Report by the Installation Historic Preservation Officer.

6.2.5 SOP For Emergency Discovery Procedures

1. In the event of inadvertent discoveries of archaeological or historical remains at KTA, the following emergency procedures should be implemented:
2. Halt all activities in the area immediately. **DO NOT REMOVE OR FURTHER DISTURB THE PROPERTY.** Steps should be taken to protect the resources from further damage (i.e., protection from the elements, looters, etc.).
3. Inform security personnel of the find.
4. Security personnel shall notify the Installation Historic Preservation Officer and the Base Commander and transfer information regarding the location, nature, and circumstances of the discovery.
5. The Installation Historic Preservation Officer shall;
 - a) Enlist the services of a qualified professional archaeologist to evaluate the find.

- b) Consult with the archaeologist regarding the development of a treatment plan if necessary.
 - c) Ensure that the treatment plan is adhered to.
 - d) After completion of archaeological investigations notify appropriate departments when activity in the area may resume, and under what stipulations (i.e. archaeological monitoring if necessary).
6. In the event that the inadvertent discovery involves human remains, the Installation Historic Preservation Officer shall;
- a) Notify the Secretary of the Army in writing of the inadvertent discovery of human remains (as outlined in Section 3(d) of the Native American Graves Protection and Repatriation Act).
 - b) Notify the appropriate Native Hawaiian Organizations regarding the inadvertent discovery of Native Hawaiian remains.
 - c) Coordinate with appropriate Native Hawaiian Organizations for the development and implementation of a burial treatment plan as outlined by the Native American Graves Protection and Repatriation Act.
 - d) Ensure that the burial treatment plan is followed.
 - e) Notify the appropriate departments when the activity may resume and under what stipulations.
7. All Emergency Discoveries and consequent actions shall be summarized in the annual Historic Preservation Compliance Report by the Installation Historic Preservation Officer.

6.2.6 SOP For Military Personnel Involved in Training Activities

Military personnel involved in training activities at Kahuku Training Area should undergo cultural resources sensitivity training. It is the responsibility of the Installation Historic Preservation Officer to provide this training to military personal. The training should included the following information;

1. the archaeological and historical resources located at Kahuku Training Area

2. the potential for undiscovered archaeological and historical resources at Kahuku Training Area
3. the significance, value, and importance of these resources to all people
4. the legislation protecting these resources, namely ARPA/NAGPRA
5. the potential and identified threats to these resources as a result of training exercises outlined in Section 4.2
6. the implementation plan and restrictions to help mitigate those adverse effects on archaeological and historical resources as outline in Section 6.1

6.2.6.1 Training Methods For Military Personnel

The methods utilized to train military personnel about cultural resources can vary, some examples of such training techniques are as follows:

1. brochures or informational pamphlets could be created and distributed to military personnel involved in training activities at KTA
2. informational videos could be created and shown to military personnel involved in training activities at KTA
3. classroom presentations could be provided to military personnel by the Installation Historic Preservation Officer or an agent of the IHPO
4. instructional field trips to known archaeological and historical resources could be conducted by the Installation Historic Preservation Officer or an agent of the IHPO.

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Appendix A
Land Commission Award Testimonies

Appendix B
Draft Report
Archaeological Inventory Survey of the Kahuku Training Area and Preparation of a
Historic Preservation Plan for the Legacy Resource Management Program,
O`ahu Island, Hawaii