



MCB HAWAII KANEOHE BAY PALI KILO BEACH COTTAGES EXPANSION

Environmental Assessment

Kaneohe, Oahu, Hawaii

JULY 2016





MCB HAWAII KANEOHE BAY PALI KILO BEACH COTTAGES EXPANSION

Environmental Assessment

Kaneohe, Oahu, Hawaii

JULY 2016



**DEPARTMENT OF THE NAVY
UNITED STATES MARINE CORPS**

**FINDING OF NO SIGNIFICANT IMPACT FOR THE PROPOSED PALI KILO BEACH COTTAGES
EXPANSION PROJECT AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII**

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality regulations (40 CFR Parts 1500-1508) implementing the procedural provisions of NEPA, Environmental Compliance and Protection Manual, Chapter 12, Marine Corps Order (MCO) P5090.2A CH 3 of 26 August 2013, and U.S. Marine Corps (USMC) NEPA Manual (Version 2 of September 2011), the USMC gives notice that an Environmental Assessment (EA) has been prepared for the Pali Kilo Beach Cottages Expansion Project at Marine Corps Base Hawaii (MCBH), Kaneohe Bay, Oahu, Hawaii. Based upon the EA, the proposed action was determined to not result in significant impacts to the human or natural environment; therefore, an Environmental Impact Statement (EIS) is not required.

Background: The Marine Corps Community Services (MCCS) manages 11 existing single and duplex recreational cottages (13 units) in the Pali Kilo district of MCBH, Kaneohe Bay, Oahu, Hawaii. MCCS is proposing the development of additional recreational cottages. The purpose of this proposed action is to increase the number of existing recreational cottages to meet current and future demand, and promote the overall morale and welfare of the USMC and U.S. Department of Defense (DOD) community. The need to increase MCCS's recreational lodging at Pali Kilo is due to high occupancy rates throughout the year resulting in long wait lists and having to frequently turn away guests. The proposed mix of additional lodging units would expand the range of affordable rental rates, and support MCCS's recreational housing program objectives.

Proposed Action: The proposed action would construct 19 new recreational cottages (16 duplex and 3 single), and an Efficiency Unit (EU) complex (14 units) comprising a total of 49 new lodging units within the 16.8-acre project site. The new cottages would be single-story, wood-framed buildings similar in character to the existing cottages and range in size from 950 square feet (single unit) to about 2,600 square feet (duplex unit).

The EU complex would consist of studio units in a cluster of single-story buildings and a separate maintenance building. The studio units would have a floor area of about 450 square feet. The maintenance building would be used for housekeeping, an administrative office, and storage. The EU complex would be constructed on a previously developed 0.44-acre site with an existing facility used to store emergency generators and other portable equipment. That use, referred to as the Building 1180 site, would be relocated to a new facility in a vacant area of the base along D Street.

Access driveways to the new cottages and supporting utilities such as electrical power, communication, potable water, and sewer collection would be constructed to connect with the existing systems serving the area. Proposed construction is intended to comply with a minimum Leadership in Energy and Environmental Design (LEED) Silver certification.

FINDING OF NO SIGNIFICANT IMPACT FOR THE PROPOSED PALI KILO BEACH COTTAGES EXPANSION PROJECT AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII

The design and construction of the new cottages and EU complex would be implemented in phases, subject to MCCA funding and program priorities, starting in late 2016. It is estimated that this project should be completed within a 10-year timeframe.

Alternatives Analyzed: Alternatives to the proposed action included: 1) No Action Alternative; and 2) Pali Kilo Beach EU Alternative. The Pali Kilo Beach EU Alternative is a variation of the proposed action with up to 45 new lodging units constructed with the main difference being the EU complex now situated inland of Pali Kilo Beach instead of at the Building 1180 site. Two duplex cottages would be constructed at the Building 1180 site, and two duplex cottages proposed on the ridge overlooking Pali Kilo Beach would be eliminated. This alternative was rejected because of potential adverse effects on historic sites and impact upon biological resources from increased recreational usage at Pali Kilo Beach. The No Action Alternative was rejected because it would not meet the purpose and need for the proposed action.

Environmental Effects: The EA evaluated probable direct, indirect, and cumulative impacts of the proposed action and alternatives on relevant environmental resources. The proposed action would not result in significant impacts to the following resources: geology, topography, soils, natural and man-made hazards, air quality, noise, terrestrial biological resources, visual resources, land use compatibility, infrastructure, surface and water quality, and recreation. The Hawaii Coastal Zone Management Office has acknowledged that the proposed action is an activity covered by the 2009 Navy and Marine Corps *de minimis* list under the State of Hawaii Coastal Zone Management Act, and would not result in any reasonably foreseeable direct or indirect effects to uses or resources within the Hawaii Coastal Zone.

Marine Biological Resources. MCBH conducted informal consultation with the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act. These parties agreed to a determination that the proposed action may affect, but is not likely to adversely affect, Federally threatened or endangered sea turtle species or the Hawaiian monk seal subject to mitigation consisting of implementing construction best management practices (BMP), measures addressing ocean recreation behavior (e.g. designating water craft launch areas, controlling vehicle access, etc.), and extensive outreach and education of guests by MCCA. MCBH also consulted on Essential Fish Habitat (EFH) with NMFS in accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976. Although the proposed action's construction footprint is primarily terrestrial, future impacts to essential fish habitat are possible due to increased recreational activity in the nearshore marine environment. MCBH and NMFS agreed that the proposed action may affect EFH, but effects will be minimal and insignificant because BMPs and conservation measures will be taken to minimize and avoid adverse effects.

Cultural Resources. As part of the MCBH Section 106 consultation with the State Historic Preservation Officer (SHPO) and other consulting parties, construction of the proposed action (19 cottage buildings and 14-unit EU) would have had an adverse effect on several of the

**FINDING OF NO SIGNIFICANT IMPACT FOR THE PROPOSED PALI KILO BEACH COTTAGES
EXPANSION PROJECT AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII**

historic properties identified within the project's area of potential effect. However, modifications were made to reduce the number of lodging units from 49 to 33 to avoid these historic properties. Accordingly, only 12 cottage buildings and a smaller 10-unit EU complex will be constructed. The smaller EU complex layout would also be re-configured to avoid historic properties and encroachment into the floodplain at the Building 1180 site. The SHPO concurred with MCBH that the reduced number of cottages and smaller EU complex would avoid and have no adverse effect on historic properties. In addition, archaeological monitoring will be implemented during construction.

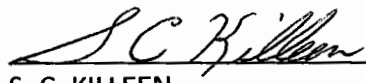
Public Involvement: A 30-day public review period for the Draft Finding of No Significant Impact (DFONSI) and EA for the proposed action was initiated with a Notice of Availability (NOA) published in the Honolulu Star-Advertiser on June 17, 18, and 19, 2016. Notice was also published in the July 8, 2016 edition of *The Environmental Notice*, the bi-monthly bulletin of the State Department of Health, Office of Environmental Quality Control (OEQC). In addition to the OEQC website, the NOA, DFONSI, and EA were made available to the public on the MCBH website.

No comments were received.

Finding: Based on the information gathered and analysis conducted during the preparation of this EA, the USMC has determined that the modified proposed action (reduced number of units and EU complex re-configuration) will have no significant impacts on the quality of the human or natural environment. Mitigation and best management practices will be implemented to further minimize both short-term construction and long-term effects on the environment. Consequently, an EIS is not required.

Point of Contact: For further information, please contact Naval Facilities Engineering Command Pacific, Building 258 Makalapa Drive, Suite 100, Pearl Harbor, Hawaii 96860-3134 (Attn: Pali Kilo Beach Cottages EA Project Manager).

21 SEP 2016
Date


S. C. KILLEEN
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base Hawaii

This page intentionally left blank

Summary

Type of Document:	Environmental Assessment (EA)
Title of the Proposed Action:	Pali Kilo Beach Cottages Expansion Project; Marine Corps Base (MCB) Hawaii, Kaneohe Bay
Lead Agency	Department of the Navy
Action Proponent	Commanding Officer, MCB Hawaii
Location of the Proposed Action	MCB Hawaii, Kaneohe Bay Oahu, Hawaii
For Further Information	Mr. Alan Suwa Naval Facilities Engineering Command, Pacific 258 Makalapa Drive, Suite 100 JBPHH, Hawaii 96860-3134 Telephone (808) 472-1450

Abstract

MCB Hawaii Marine Corps Community Services (MCCS) is proposing the development of additional recreational cottages in the Pali Kilo district of MCB Hawaii Kaneohe Bay, Oahu, Hawaii. The project area is about 16.8 acres.

Project Description. The proposed action would construct 19 new recreational cottages (16 duplex and 3 single), and an Efficiency Unit (EU) complex (14 units). The purpose of the proposed action is to increase the number of recreational cottages meet current and future demand, and promote the overall morale and welfare of the U.S. Marine Corps and U.S. Department of Defense (DOD) community. This mixture of lodging units would expand the range of affordable rental rates, and support MCCS's recreational housing program objectives.

The new cottages would be single-story, wood-framed buildings constructed on posts and piers anchored to poured-in-place concrete foundations, and range in size from 950 square feet (single unit) to about 2,600 square feet (duplex unit). Each unit would include a large private deck to enjoy views of Kaneohe Bay. The EU complex would consist of a cluster of single-story buildings along with a separate maintenance building. The studio units would have a floor area of about 450 square feet. The maintenance building would be used for housekeeping, an administrative office, and storage area. The

EU complex would be constructed on a previously developed, 0.44-acre site used to store emergency generators and other portable equipment. That use, referred to as the Building 1180 site, would be relocated to a vacant area in the operational area of the base along D Street.

Access driveways to the new cottages and supporting utilities such as electrical power, communication, potable water, and sewer collection would be constructed to connect the new buildings with the existing systems serving the area. Proposed construction is intended to comply with a minimum Leadership in Energy and Environmental Design (LEED) Silver certification.

The proposed action would be implemented once the environmental review process is completed in the summer of 2016. The design phase and construction of lodging units would be implemented in phases, subject to MCCA funding and program priorities, starting in late 2016. It is estimated that this project should be completed within a 10-year timeframe.

Alternatives Considered. Alternatives to the proposed action included: 1) No Action Alternative; and 2) Pali Kilo Beach EU Alternative. The Pali Kilo Beach Alternative is a variation of the proposed action with up to 45 new lodging units constructed with the main difference being: 1) the EU complex would be situated inland of Pali Kilo Beach instead of at the Building 1180 site; 2) two duplex cottages would be constructed at the Building 1180 site; and 3) two duplex cottages located on the ridge overlooking Pali Kilo Beach would be removed. This alternative was rejected because it would have adverse effects on historic sites, and impact botanical resources and increase recreational activities at Pali Kilo Beach. The No Action Alternative was rejected because it would not meet project objectives or the purpose and need.

Environmental Consequences. The Proposed Action would not result in significant impacts to the following resources: geology, topography, soils, natural and man-made hazards, air quality, noise, terrestrial biological resources, visual resources, land use compatibility, infrastructure, surface and water quality, and recreation.

NAVFACPAC conducted informal consultation with the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act. It was determined that the proposed action may affect, but is not likely to adversely affect, Federally threatened or endangered sea turtle species or the Hawaiian monk seal subject to mitigative measures consisting of construction best management practices (BMP), several conservation measures, other measures addressing ocean recreation behavior (e.g. designating water craft launch areas, controlling vehicle access, etc.), and extensive outreach and education of guests by MCCA. NAVFACPAC also conducted consultation on Essential Fish Habitat (EFH) with NMFS in accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976. It was determined that the proposed action's impact area is terrestrial; however, future impacts to essential fish habitat are possible as a result of increased recreational activity in the nearshore marine

environment. However, effects will be minimal and insignificant because steps (BMPs, conservation measures, etc.) can be taken to minimize and avoid adverse effects on EFH.

As part of MCB Hawaii's Section 106 consultation with the State Historic Preservation Officer (SHPO) and other consulting parties, construction of the proposed action (19 cottage buildings and 14-unit EU) would have an adverse effect on several of the historic properties identified within the project's area of potential effect. MCB Hawaii decided to reduce the number of lodging units from 49 to 33 to avoid these historic properties. Accordingly, only 12 cottage buildings and a reduced 10-unit EU complex would be constructed under this modification. This modification to the proposed action was determined to have no adverse effect on historic properties because remaining cottages and the EU complex would avoid these historic properties. MCB Hawaii received SHPO's concurrence on this. Other mitigation, such as archaeological monitoring, would be implemented during construction of these cottages and EU complex.

The smaller EU complex (10 units) under the modification to the proposed action would also be re-configured to avoid encroachment into the floodplain at the Building 1180 site, in accordance with Executive Order (EO) 11988 Floodplain Management guidance and the recent update (EO 13690). The proposed action is listed among the *de minimis* activities agreed upon in 2009 between the Navy and the State of Hawaii, Coastal Zone Management (CZM) Program, and is not subject to further review by the State CZM Program. The Navy notified the State CZM Program Office of its use of the De Minimis Activity List in the preparation of the EA and the Office acknowledged receipt of the Navy's notification.

This page intentionally left blank

TABLE OF CONTENTS

Chapter / Section	Page
TABLE OF CONTENTS	i
1.0 PURPOSE AND NEED	1-1
1.1 Introduction	1-1
1.2 Project Location	1-1
1.2.1 Surrounding Area.....	1-2
1.3 Background	1-2
1.3.1 MCB Hawaii Kaneohe Bay.....	1-2
1.3.2 Cottages at Kaneohe Bay.....	1-5
1.3.3 Marine Corps Community Services	1-8
1.4 Purpose and Need for Action.....	1-8
1.4.1 Purpose for Proposed Action.....	1-8
1.4.2 Need for Proposed Action	1-9
1.5 Scope of Environmental Analysis.....	1-9
1.6 Relevant Laws and Regulations	1-10
1.7 Environmental Permits and Agency Consultations.....	1-11
1.8 Public Participation	1-11
2.0 PROPOSED ACTION AND ALTERNATIVES	2-1
2.1 Summary of Proposed Action and Alternatives.....	2-1
2.2 Framework for Alternatives Development	2-2
2.3 Description of the Proposed Action and Alternatives	2-4
2.3.1 Proposed Action	2-4
2.3.1.1 Modifications to Proposed Action	2-9
2.3.2 Pali Kilo Beach EU Alternative	2-10
2.3.3 No Action Alternative	2-12
2.3.4 Alternatives Considered But Eliminated From Detailed Study.....	2-13
2.4 Environmental Consequences of the Proposed Action and Alternatives.....	2-14
3.0 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	3-1
3.1 Geology, Topography, and Soils.....	3-2
3.1.1 Affected Environment	3-2
3.1.2 Potential Impacts.....	3-5
3.2 Natural and Man-Made Hazards	3-8
3.2.1 Affected Environment	3-8
3.2.2 Potential Impacts.....	3-12

Chapter / Section	Page
3.3 Air Quality	3-13
3.3.1 Affected Environment	3-13
3.3.2 Potential Impacts.....	3-14
3.3.3 Clean Air Act	3-15
3.4 Noise	3-15
3.4.1 Affected Environment	3-15
3.4.2 Potential Impact	3-16
3.4.3 Mitigation Measures	3-17
3.5 Terrestrial Natural Resources	3-17
3.5.1 Affected Environment	3-17
3.5.2 Potential Impacts.....	3-20
3.5.3 Endangered, Threatened or Protected Species.....	3-21
3.6 Visual Resources	3-23
3.6.1 Affected Environment	3-23
3.6.2 Potential Impacts.....	3-23
3.7 Land Use Compatibility	3-26
3.7.1 Affected Environment	3-26
3.7.2 Potential Impacts.....	3-26
3.8 Infrastructure Facilities	3-27
3.8.1 Affected Environment	3-27
3.8.2 Potential Impacts.....	3-29
3.8.3 Clean Water Act of 1972.....	3-33
3.9 Recreational Facilities	3-33
3.9.1 Affected Environment	3-33
3.9.2 Potential Impacts.....	3-35
3.10 Socio-Economic Environment	3-37
3.10.1 Affected Environment	3-37
3.10.2 Potential Impacts.....	3-37
3.11 Surface Waters and Water Quality	3-39
3.11.1 Affected Environment	3-39
3.11.2 Potential Impacts.....	3-39
3.12 Marine Resources	3-41
3.12.1 Affected Environment	3-41
3.12.1.1 Existing Marine Habitat	3-41
3.12.1.2 Threatened, Endangered and Protected Species	3-46
3.12.2 Potential Impacts.....	3-49
3.12.3 Essential Fish Habitat.....	3-52
3.12.4 Section 7 Consultations (ESA).....	3-57

Chapter / Section	Page
3.13 Cultural Resources	3-58
3.13.1 Affected Environment	3-58
3.13.1.1 Historical Background	3-58
3.13.1.2 Identification of Existing Historic Properties	3-61
3.13.1.3 Architectural Resources	3-64
3.13.1.4 Results of Archaeological Fieldwork	3-66
3.13.2 Potential Impacts.....	3-68
3.13.3 Mitigation of Potentially Adverse Effects	3-69
3.13.4 Section 106 Consultation (NHPA)	3-71
3.14 Secondary and Cumulative Impacts.....	3-72
3.14.1 Secondary Effects	3-72
3.14.2 Cumulative Impacts	3-72
3.15 Unavoidable Adverse Effects	3-74
4.0 CONFORMANCE WITH FEDERAL LAND USE PLANS AND POLICIES	4-1
4.1 Coastal Zone Management (CZM) Act of 1972.....	4-1
4.2 MCB Hawaii Master Plan	4-2
4.3 MCB Hawaii Integrated Natural Resources Management Plan	4-3
4.4 Unified Facilities Criteria; Installation Master Planning	4-4
4.5 MCB Hawaii Integrated Cultural Resources Management Plan	4-6
5.0 PUBLIC AND AGENCY INVOLVEMENT, REVIEW, AND CONSULTATION	5-1
6.0 REFERENCES	6-1
7.0 LIST OF PREPARERS	7-1

List of Figures

1.1	Project Location Map	1-3
1.2	Project Vicinity Map	1-4
1.3	Existing Beach Cottages at Pali Kilo	1-6
1.4	Oblique Aerial Views of Pali Kilo Coastline Area	1-7
2.1	Proposed Action (Building 1180 EU Option)	2-5
2.2	Duplex Cottage Representative Floor Plan	2-7
2.3	Efficiency Unit Representative Floor Plan for Studio Unit	2-8
2.4	Pali Kilo Beach EU Alternative	2-11
3.1	Existing Topography Map (Proposed Action)	3-3
3.2	Existing Soils Map (Proposed Action)	3-4
3.3	Flood Hazard Areas and Tsunami Evacuation Area (Proposed Action)	3-10
3.4	Viewsheds	3-24
3.5	Reef Strata Along Pali Kilo Coastline	3-42
3.6	Area of Potential Effect (APE from Archaeological Inventory Survey)	3-63
3.7	Historic Buildings Near Building 1180 Relocation Site	3-65
3.8	Modifications to Proposed Action Under Section 106 Consultation	3-70

List of Tables

1.1	Environmental Permits or Consultations	1-11
2.1	Summary of Environmental Consequences	2-14
3.1	Vegetation Species List	3-19
3.2	Trip Generation for Project	3-32
3.3	Percent Live Coral Cover Among Strata By Species, 2012-2013	3-44
3.4	Seal Haul Outs Reported at MCB Hawaii Kaneohe Bay Between 2004 and April 2015	3-47
3.5	Turtle Haul Outs Reports at MCB Hawaii Kaneohe Bay Between 2004 and April 2015	3-48
3.6	EFH and HAPC Designations Relevant to the Pali Kilo Project Area	3-53
3.7	Previously Recorded Archaeological Sites within Project Area	3-61
3.8	Summary of Previously Recorded and Unrecorded Historic Properties Identified within the Area of Potential Effect	3-66

Appendices

A	Photos of Project Site and Surrounding Area
B	Marine Ecological Assessment
C	ESA Section 7 and EFH Consultation
D	NHPA Section 106 Consultation
E	Coastal Zone Management Act Determination

Acronyms and Abbreviations

§	Section
ac	acre(s)
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AHPA	Archaeological and Historic Preservation Act
APE	area of potential effect
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CH ₄	methane
CFR	Code of Federal Regulations
cm	centimeter(s)
CO ₂	carbon dioxide
CWA	Clean Water Act
CZ	Clear Zone
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dB	decibel(s)
DLNR	State of Hawaii, Department of Land and Natural Resources
DOD	Department of Defense
DOE	U.S. Department of Energy
DOH-CWB	State of Hawaii Department of Health, Clean Water Branch
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EMF	electromagnetic field
EO	Executive Order
ESA	Endangered Species Act
FEP	Fishery Ecosystem Plan
FMP	Fishery Management Plan
FR	Federal Register
ft	foot (feet)
ft ²	square foot (feet)
FY	Fiscal Year
ha	hectare(s)
HABS/HAER	Historic American Building Survey/Historic American Engineering Records
HAPC	Habitat Area of Particular Concern
HECO	Hawaiian Electric Company
HINMREC	Hawaii National Marine Renewable Energy Center
Hz	hertz
ICRMP	Integrated Cultural Resources Management Plan

in	inch(es)
INRMP	Integrated Natural Resources Management Plan
kg	kilogram(s)
kHz	kilohertz
km	kilometer(s)
km ²	square kilometer(s)
kV	kilovolt(s)
kW	kilowatt(s)
lb	pound(s)
m	meter(s)
m ²	square meter(s)
m ³	cubic meter(s)
MCB Hawaii	Marine Corps Base Hawaii Kaneohe Bay
mi	mile(s)
mm	millimeter(s)
mi ²	square mile(s)
MMPA	Marine Mammal Protection Act
MOA	memorandum of agreement
ms	millisecond(s)
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act of 1976
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHL	National Historic Landmark(s)
NHPA	National Historic Preservation Act
nm	nautical mile(s)
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NCCOS	National Centers for Coastal Ocean Science
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
PTO	power take-off
ROV	remotely operated vehicle
SEL	sound exposure level
SHPO	State Historic Preservation Officer(s)
SPL	sound pressure level
TTS	temporary threshold shift
TWhr	terawatt-hour(s)
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	United States Coast Guard

USGS	United States Geological Survey
USFWS	U.S. Fish and Wildlife Service
USMC	United States Marine Corps
WPRFMC	Western Pacific Regional Fishery Management Council
WQC	Water Quality Certification
yd	yard(s)
yd ³	cubic yard(s)

Page intentionally left blank

1.0 PURPOSE AND NEED

1.1 Introduction

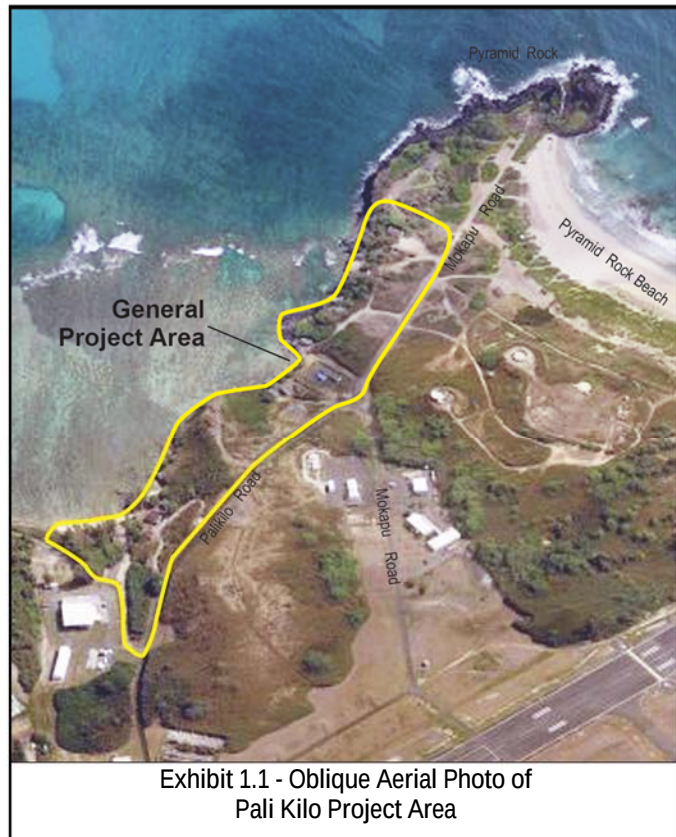
The Marine Corps Community Services (MCCS) of the U.S. Marine Corps Base Hawaii (MCB Hawaii) is proposing the MCB Hawaii Kaneohe Bay Pali Kilo Beach Cottages Expansion Project (Project). This Environmental Assessment (EA) addresses the development of additional recreational cottages within the Pali Kilo project site, at MCB Hawaii Kaneohe Bay, Oahu, Hawaii.

The United States (U.S.) Department of the Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [U.S.C.] parts 4321-4370h), as implemented by the Council on Environmental Quality Regulations (40 Code of Federal Regulations [CFR] parts 1500-1508), Environmental Compliance and Protection Manual, Chapter 12, Marine Corps Order (MCO) P5090.2A CH 3 of 26 August 2013, and U.S. Marine Corps (USMC) NEPA Manual (Version 2 of September 2011) which provides policy for implementing CEQ regulations and NEPA.

The proposed action is to construct 19 new recreational cottages (16 duplex and 3 single), and an Efficiency Unit Complex (14 units) comprising a total of 49 new lodging units in the Pali Kilo area of MCB Hawaii Kaneohe Bay. The purpose of the proposed action is to increase the number of recreational cottages to accommodate additional guests, meet current and future demand, and promote the overall morale and welfare of the U.S. Marine Corps and U.S. Department of Defense (DOD) community. The project area is about 16.8 acres as generally outlined in Exhibit 1.1.

1.2 Project Location

MCCS presently operates the 13-unit *The Cottages at Kaneohe Bay* situated along a section of the western shoreline of Mokapu Peninsula referred to as Pali Kilo, in the Heeia ahupuaa within the Koolaupoko District of Oahu. Pali Kilo is bordered by Palikilo Road to the east, Kaneohe Bay to the west, extending northward to the geological feature known as Kuau or Pyramid Rock. Building 1180 is a facility used for storing emergency generators and other portable equipment by the MCB Hawaii Facilities Department, and is located at the intersection of Palikilo Road and Mokapu Road. Figure 1.1 indicates the general location of the project area on MCB Hawaii Kaneohe Bay. Figure 1.2 is an aerial photo showing the project site and surrounding areas in greater detail.



Vehicular access to the area is by Palikilo Road¹ and Mokapu Road as shown on Figure 1.2. Palikilo Road extends longitudinally (southwest to northeast) on the eastern side and intersects with Mokapu Road near the middle of the project site. Mokapu Road extends from this intersection further north to Pyramid Rock. Both are paved two-lane, two-way roads. Paved and unpaved driveways provide access to cottages from Palikilo Road and Mokapu Road. Parking is available adjacent to each cottage.

1.2.1 Surrounding Area

Pyramid Rock, or Kuau, is a geological formation (puu) at the northwestern point of the Mokapu Peninsula. Pyramid Rock Beach, a large sandy beach extending eastward from Pyramid Rock, is used for various recreational activities. Occasionally, the beach and adjacent inland areas are used for military training exercises. Figure 1.2 shows existing conditions and features in the surrounding area.

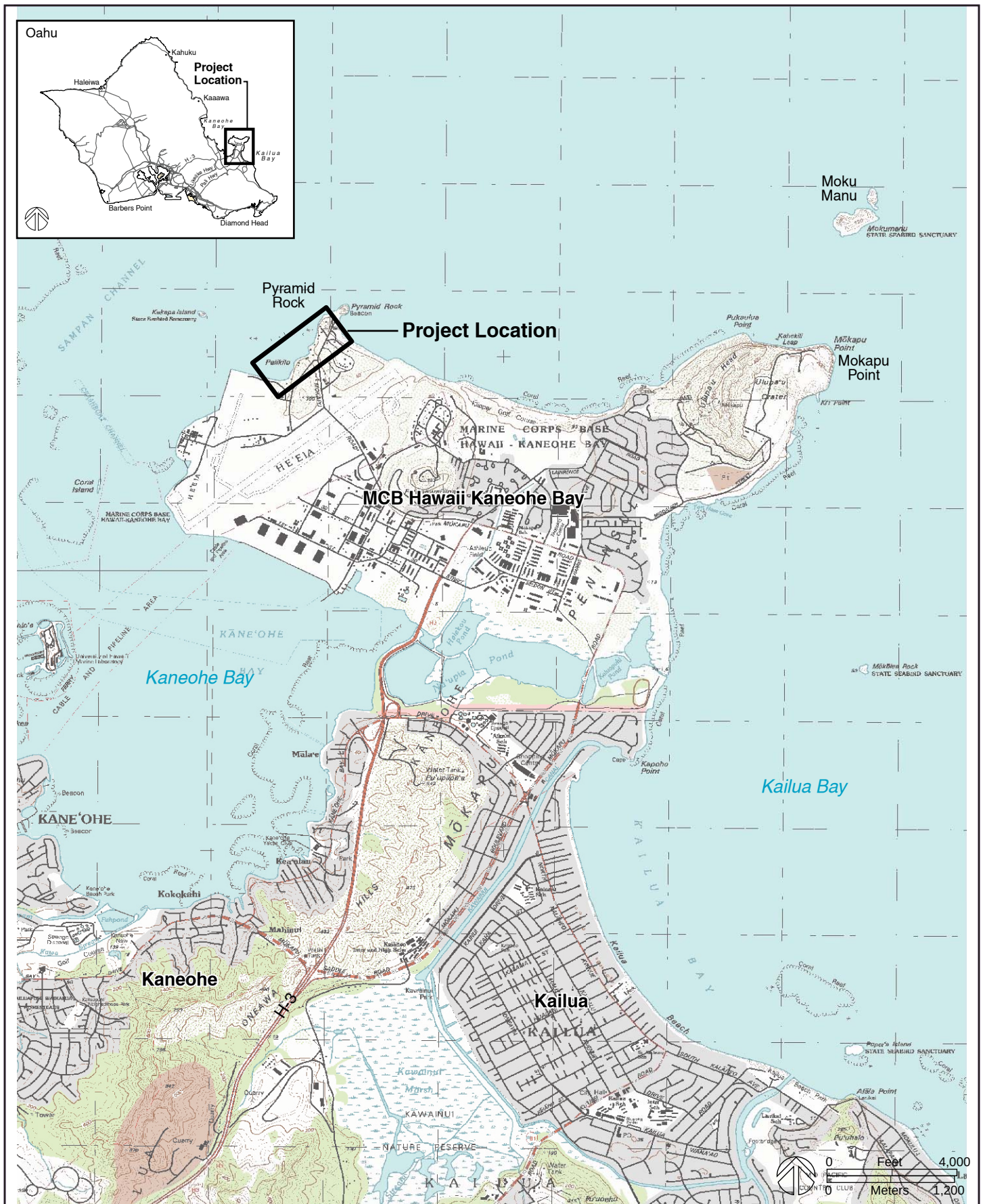
The former Marine Air Control Squadron (MACS) Training Area that was also used for various military training exercises is located south of Pyramid Rock Beach and east of Mokapu Road. A storage building and associated structures are located southeast of the Palikilo Road and Mokapu Road intersection. Pali Kilo Beach lies along the southwest portion of the project area.

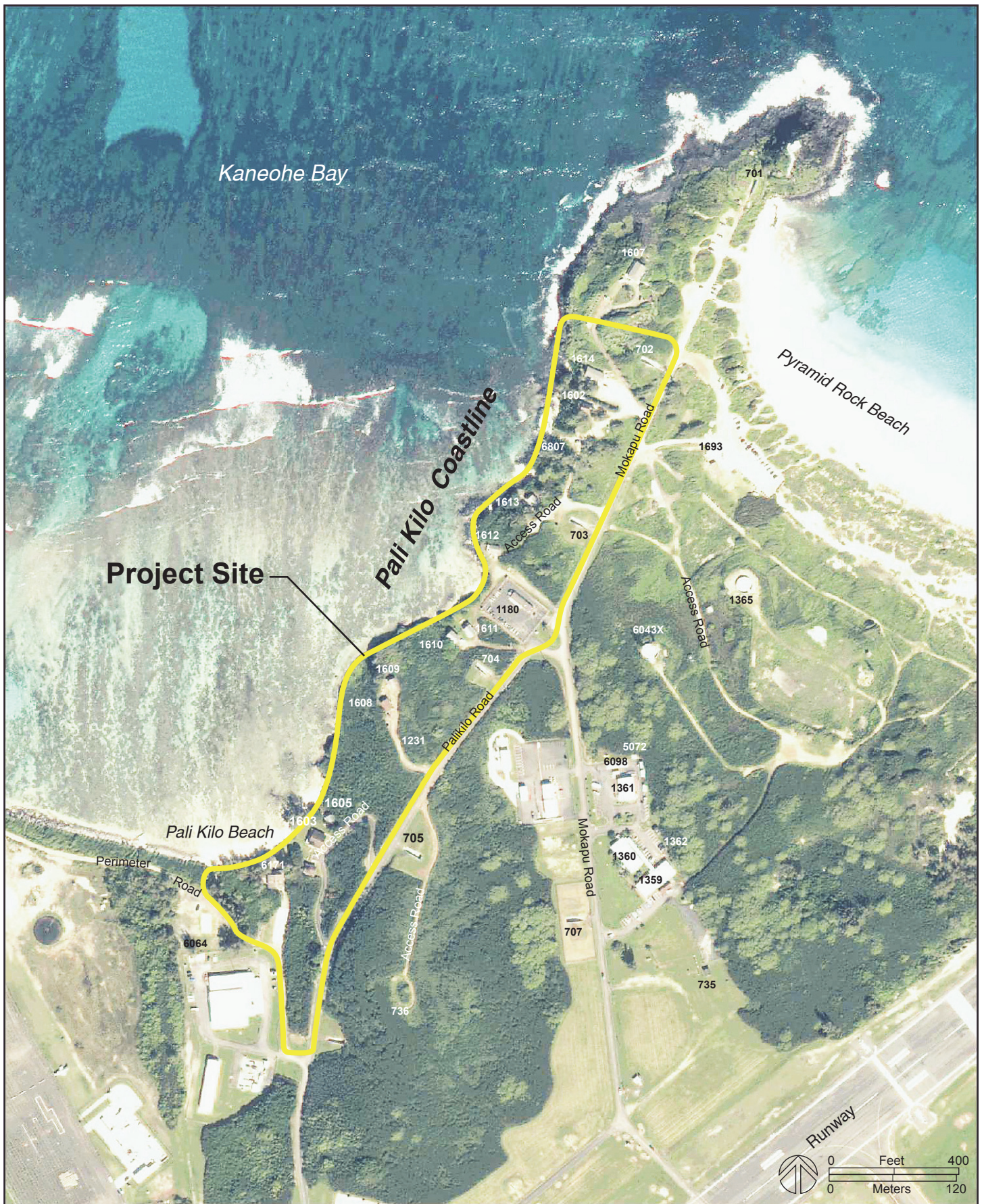
1.3 Background

1.3.1 MCB Hawaii Kaneohe Bay

MCB Hawaii Kaneohe Bay (Base) encompasses 2,951 acres on Mokapu Peninsula on the windward side of Oahu. Mokapu Peninsula is bounded by the Pacific Ocean on the north, Kaneohe Bay on the west, Kailua Bay on the east, and the Nuupia Fish Ponds complex on the south. A narrow neck of sand dune and wetlands on the southeast connects the peninsula to the main island. The major land use in the western and southwestern portions of the Base is a runway complex (Runway 4/22) and related aircraft operation and maintenance facilities. The eastern portion of the installation is dominated by residential, and training and operations facilities. Ulupau Crater in the northeastern corner of the peninsula is a secured training facility that includes a live-fire range. The central portion of the installation is used for administrative, medical, and community support. Family housing occupies the north-central and northeastern portions of the installation.

¹ "Palikilo" is the proper name for the road serving the project area which is a different spelling than the historic name for the area (Pali Kilo).





Project Vicinity Map
 MCB Hawaii Kaneohe Bay
 Pali Kilo Cottages Expansion Project

Figure 1.2

1.3.2 Cottages at Kaneohe Bay

The Cottages at Kaneohe Bay is comprised of 11 cottages that provide 13 temporary recreational lodging units (two of the buildings are duplex cottages with remaining nine buildings single unit cottages). Both duplex and single unit cottages each have two bedrooms. Figure 1.3 identifies these existing cottages, including duplex cottages 6171 and 1603, located at the southern end of the project area along Pali Kilo Beach. Two single unit cottages (1605 and 1606) are also located in this Pali Kilo Beach area.

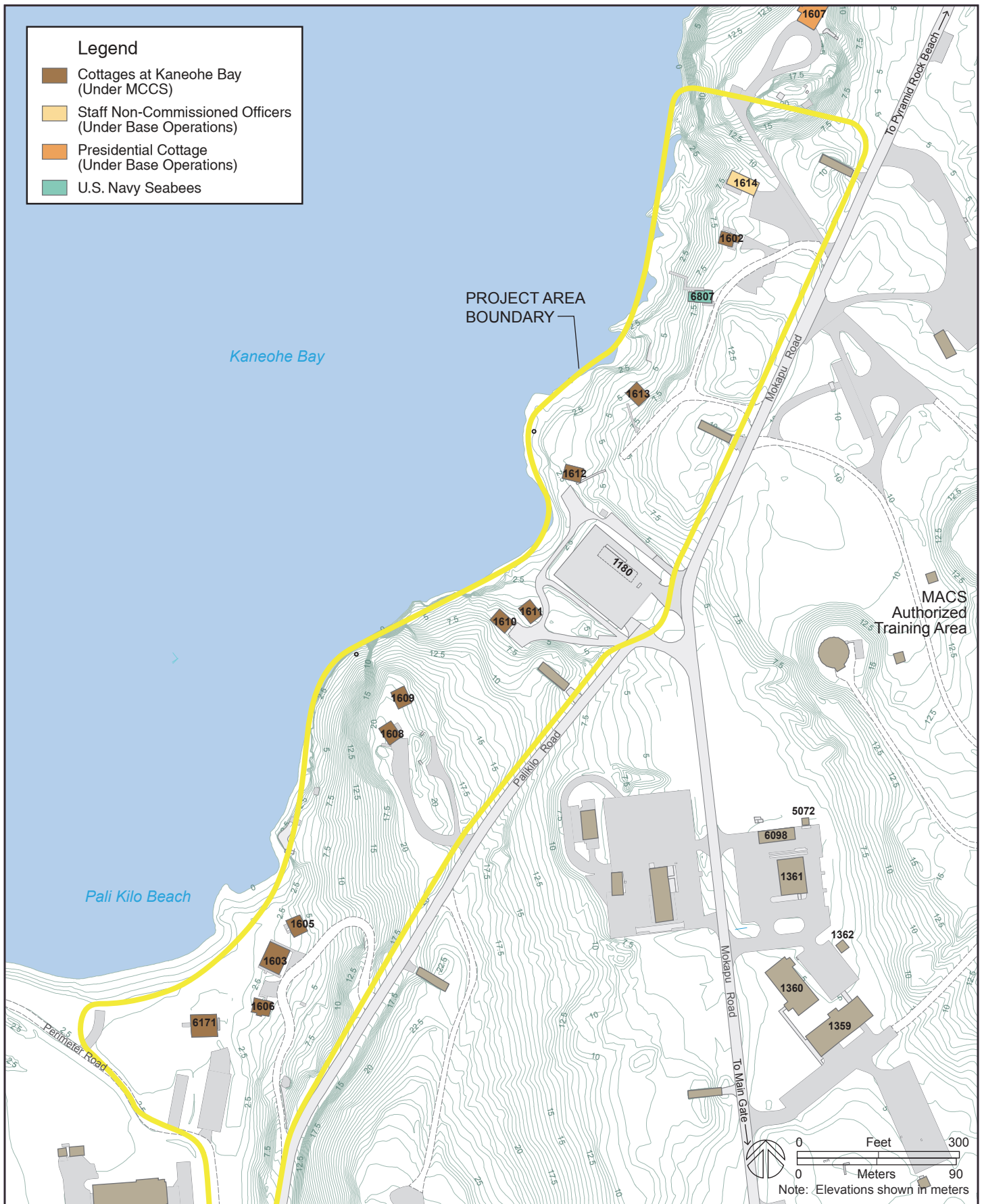
Three additional cottages (Buildings 6807, 1614 and 1607) situated at the northern end of the project area, are used for recreational lodging, but only one is managed by MCCS. Building 6807 located within the northern extent of the project area, is a recently re-constructed cottage used by the U.S. Navy Seabees, but is also managed by MCCS. Building 1614 is a cottage used by the Staff Non-Commissioned Officers (SNCO) and managed by Base Operations. Building 1607 is located at the northern end of the project area near Pyramid Rock and is known as the Presidential Cottage. The Presidential Cottage is operated by Base Operations and reserved for very important persons (VIPs).

All of these buildings were generally constructed between 1979 and 1999, with the recent reconstruction of Building 6807 completed in 2013. Figure 1.4 provides photos of existing buildings. Utilities serving the existing cottages include potable water, sewer collection, and electrical power via overhead distribution lines. Storm water drainage in the area consists of surface runoff toward the ocean.

The cottages are considered recreational facilities, and are not used for permanent residence. The cottages are only available for “rest and relaxation” and all have a maximum one-week occupancy limit. Reservations are given based upon an order of priority with active duty MCB Hawaii personnel having first preference. Active duty personnel occupied elsewhere have second preference, followed by retirees and other Department of Defense personnel with third preference. About 90 percent of guests consist of active duty personnel. Check-in is at 3:00 p.m., and check-out is at 11:00 a.m.

The cottages are popular due to the units being located close to the beach and shoreline. Therefore, guests are able to participate in various ocean-related recreational activities such as sun bathing, swimming, snorkeling, and surfing. Guests also have access to other recreational opportunities within the Base such as golf and marina amenities. Typically, guests leave in the morning to recreate and return to their units in the afternoon. The vast majority of guests staying at the cottages consist of the “family unit.” To a lesser extent, guests consist of single marines or a group of marines.

Occasionally (4 to 6 times a year), larger groups rent several cottages to celebrate a change of command. The Base supports these types of infrequent large group functions. Weddings also occur a few times a year (2-6 times a year), and typically consist of a day event. These infrequent situations typically result in a larger number of guests and activities.



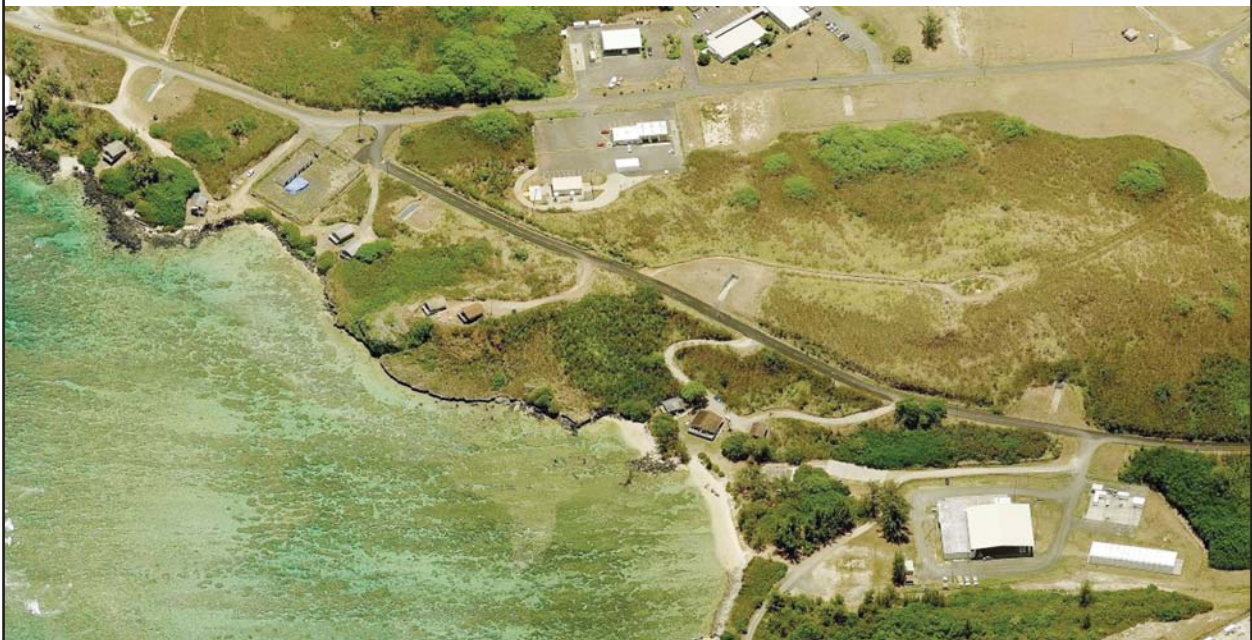
Existing Beach Cottages at Pali Kilo

Figure 1.3

MCB Hawaii Kaneohe Bay
 Pali Kilo Cottages Expansion Project



Oblique Aerial View of Pali Kilo Coastline's Northern Section



Oblique Aerial View of Pali Kilo Coastline's Southern Section

Oblique Aerial Views of Pali Kilo Coastline Area

Figure 1.4

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

1.3.3 Marine Corps Community Services

Formerly known as Morale, Welfare and Recreation, this organization was restructured to include Family Services under one organization, and renamed Marine Corps Community Services, or MCCS.. Since its inception, MCCS's strategic planning has been aimed at integrating and aligning these vital support services to meet the current and future needs of the unit, individual Marine, and broader Marine Corps family.

The *Marine Corps Community Services Vision and Strategy 2025* (MCCS, no date) outlines how MCCS will achieve its vision and strategy, which, in turn, serves as the catalyst to accomplish its primary mission of "taking care of marines and their families." This document outlines the values, principles, and core competencies of the organization. It is centered on seven key components: people, places, policies, performance, processes, perceptions, and programs. The proposed action is intended to support this strategic plan.

The proposed action is related to the DOD's Morale, Welfare and Recreation (MWR) program by providing additional recreational lodging at the Pali Kilo area. MWR programs are essential to maintain individual, family, and mission readiness during peacetime and in time of declared war and other contingencies. The MWR programs:

1. Are an integral part of the military pay and benefits package.
2. Build healthy families and communities and provide consistently high quality support services that are commonly furnished by other employers or State and local governments to their employees and citizens.
3. Encourage positive individual values, and aid in recruitment and retention of personnel.
4. Promote "esprit de corps" and provide for the physical, cultural, and social needs; general well-being; quality of life; and hometown community support of service members and their families.

MWR programs are classified into three categories that determine how they are funded: 1) mission essential programs; 2) community support programs; and 3) revenue generators. In addition, MWR Outreach provides programs to National Guard, Reserve, and active duty families assigned to independent duty stations that lack access to the community support programs typically provided on installations. The proposed action (i.e., recreational lodging) is considered to be an essential part of MWR's activities by providing community support services and revenue generators program elements.

1.4 Purpose and Need for Action

1.4.1 Purpose for Proposed Action

The purpose for the proposed action is to increase the availability of MCCS recreational beach lodging to better accommodate guests and their families and to complement other types of lodging currently provided at MCB Hawaii. The proposed action would add up to 35 new lodging units in single and duplex cottages configurations and an Efficiency Unit (EU) building comprised of 14 smaller studio units.

This mixture of lodging units would expand the range of affordable rental rates, and support MCCS's recreational housing program objectives. The only available coastal area within MCB Hawaii Kaneohe Bay is the Pali Kilo area where MCCA currently operates rental cottages (*The Cottages at Kaneohe Bay*). The strategic siting of new cottages and the EU complex along this isolated coastline provides for relative privacy, with ocean views of Kaneohe Bay that enhance their marketability and support the economic feasibility of this project.

Increased lodging capacity will support MCCA's ability to meet current and future needs of individual Marines and dependents, and the broader Marine Corps family thereby promoting overall morale and welfare. The Project will also better support MCCA to accomplish its primary mission to take care of Marines and their families along with the broader DOD community.

1.4.2 Need for Proposed Action

The need to increase MCCA's recreational lodging at Pali Kilo is due to high occupancy rates of over 90 percent (constant occupancy of about 12 of 13 lodging units) throughout the year resulting in long wait lists. Frequently, guests need to be turned away due to full occupancy. The demand for cottages is high because they are located in a desirable tropical beach setting and are rented at a reasonable rate (about \$130/night for a 2-bedroom/4-person unit).

The current number of existing lodging units (13) is not sufficient to support current and future needs and demand for this program. Other temporary lodging facilities within the Base include: 1) *Inns of the Corps* (102 living areas); 2) *The Cabanas* (upscale camping facilities of 29 studios); and 3) *The Klipper Villas* (2-, 3-, and 4-bedroom units along Klipper Golf Course).

The existing Pali Kilo cottage units provide Marines and other DOD personnel and their families the opportunity to relax, benefit from time with family, and enjoy a positive and rewarding experience from the facilities and available recreational opportunities. Under the MCCA 2025 Plan, support facilities should be unparalleled in terms of capability and efficiency. Therefore, additional lodging units are needed to reduce the wait list, meet current and future demand, and enable MCCA to provide facilities that better support overall morale and welfare.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include: geological resources (topography, soils), natural and man-made hazards, air quality, noise, botanical and faunal resources, visual resources, land use, infrastructure and public facilities, socio-economic environment, water and marine resources, and historic and cultural resources.

Some resource areas were considered, but not carried forward for detailed analysis because potential impacts would be nonexistent or negligible. The following resource areas were not evaluated in this EA:

Airspace: Constructing additional recreational cottages within the Pali Kilo area would not impact base operations involving air traffic, airfield clear zones or accident potential zones.

Environmental Justice: The project would not displace any existing residents or result in a disproportionately high or adverse impact on minority populations and low-income populations. Additional recreational cottages constructed would serve Marines along with other DOD personnel and their families regardless of race or income.

1.6 Relevant Laws and Regulations

The EA has been prepared based upon federal and state laws, statutes, regulations, and policies that are pertinent to the implementation of the proposed action, including the following:

- NEPA (42 U.S.C. parts 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508)
- Marine Corps regulations and guidance for implementing NEPA (Marine Corps Order 5090.2A, and USMC NEPA Manual (Version 2 of September 2011) which provide policy for implementing CEQ regulations and NEPA)
- Clean Air Act (CAA) (42 U.S.C. part 7401 et seq.)
- Clean Water Act (CWA) (33 U.S.C. part 1251 et seq.)
- Coastal Zone Management Act (CZMA) (16 U.S.C. part 1451 et seq.)
- National Historic Preservation Act (NHPA) (16 U.S.C. part 470 et seq.)
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)
- Endangered Species Act (ESA) (16 U.S.C. part 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (16 U.S.C. part 1801 et seq.)
- Marine Mammal Protection Act (MMPA) (16 U.S.C. part 1361 et seq.)
- MCB Hawaii Landscape Manual (July 2014)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. parts 703-712)
- Fish and Wildlife Coordination Act of 1958
- Executive Order (EO) 11988 Floodplain Management
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13089, Coral Reef Protection
- EO 13693, Planning for Federal Sustainability in the Next Decade

1.7 Environmental Permits and Agency Consultations

Table 1.1 summarizes the potential permits, approvals, and required consultations MCB Hawaii or its construction contractor may need to complete or obtain prior to construction.

Table 1.1: Environmental Permits or Consultations	
Oversight Agency	Permit, Approval or Consultation
MCB Hawaii	• Site approvals
U.S. Department of the Interior, Fish and Wildlife Service U.S. Department of Commerce, National Marine Fisheries Service	• Section 7 Informal Consultation; Endangered Species Act
U.S. Department of Commerce, National Marine Fisheries Service	• Essential Fish Habitat (EFH) Consultation under Magnuson-Stevens Fishery Conservation and Management Act
State of Hawaii, Department of Land and Natural Resources, Historic Preservation Officer	• Section 106 Consultation; National Historic Preservation Act
State of Hawaii, Department of Health, Clean Water Branch	• National Pollutant Discharge Elimination System (NPDES) Permit for construction (if >1 acre of land area is disturbed by construction activities).

1.8 Public Participation

MCB Hawaii conducted consultations under Section 106 of the NHPA to address project effects on historic properties. Consultation was conducted with the State Historic Preservation Division and notifications given to the Historic Hawaii Foundation, the State Office of Hawaiian Affairs, and other native Hawaiian organizations, interested parties, and the public.

A Notice of Availability (NOA) of this EA and a Draft Finding of No Significant Impact (DFONSI) was published in the Honolulu Star-Advertiser on June 17, 18, and 19, 2016 as well as in the State of Hawaii, Department of Health's Office of Environmental Quality Control's (OEQC) July 8, 2016 edition of *The Environmental Notice*. In addition to the OEQC website, the NOA, DFONSI, and EA were made available to the public on the MCB Hawaii website.

No comments were received.

This page intentionally left blank.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter presents a discussion of the proposed action and alternatives, including the No Action Alternative, and a summary of the environmental consequences associated with them. Alternatives to the proposed action must be considered in accordance with NEPA CEQ regulations for implementing NEPA, MCO 5090.2A (with Change 3, Aug 2013), and USMC NEPA Manual (Version 2 of September 2011). However, only those alternatives determined to be reasonable require detailed analysis (i.e., alternatives that are reasonable relative to their ability to fulfill the purpose and need for the project, as well as practical and feasible from an operations, technical and economic standpoint).

Constructing the EU at Pali Kilo Beach presented a reasonable alternative to the proposed action and was carried through the environmental analysis. The No-Action Alternative was also carried through the environmental analysis in compliance with CEQ requirements. Other alternatives that were considered but eliminated from further consideration are also presented in this chapter.

The project area for the proposed action and alternatives generally includes the area from the shoreline inland to Palikilo Road and Mokapu Road, and from near Pali Kilo Beach north up to Building 1607 (Presidential Cottage). This project area encompasses about 16.8 acres. This area can be described as being somewhat undeveloped in character with a predominantly rocky shoreline. The shoreline also has a few small pocket beaches, as well as a small cove at the southern extreme of the project area.

The Building 1180 site (approx. 0.44 acres) is located near the center of the project area adjacent to and west (makai) of the Palikilo Road and Mokapu Road intersection. The facility is used for storing emergency generators and other portable equipment by the MCB Hawaii Facilities Department and is not part of MCCA cottage operations. A sewer pump station serving the project area is also located near this building.

The design and construction of lodging units would be implemented in phases, subject to MCCA funding and program priorities, starting in 2016. It is estimated that this project should be completed within a 10-year timeframe, or by the end of 2026.

2.1 Summary of Proposed Action and Alternatives

The following action alternatives (including the Proposed Action) were assessed and evaluated in this EA. A summary of these is provided with more details included later in this chapter.

Proposed Action (Preferred Alternative). MCCA would add up to 49 lodging units to *The Cottages at Kaneohe Bay* by constructing 19 new cottages (16 duplex and 3 single) and a new EU complex containing 14 studio units. Under the proposed action, the EU would be located at the site currently occupied by Building 1180 (see Figure 2.1). Building 1180 would be demolished, and its equipment relocated to a new building constructed at a location in the southern area of the Base based upon coordination within MCB Hawaii Kaneohe Bay. A 10,000 square foot, open lawn area along D Street across from Building 242 has been selected as this relocation site.

Pali Kilo Beach EU Alternative. This alternative is a variation of the proposed action (see Figure 2.5) and will add up to 45 new lodging units to *The Cottages at Kaneohe Bay* by construction of 17 new single and duplex cottages and the aforementioned 14 studio unit EU complex. The main differences with the proposed action are:

1. The EU complex would be situated inland of Pali Kilo Beach, behind an existing duplex cottage (Building 6171) instead of further north at the Building 1180 site;
2. Two duplex cottages (Buildings 19 and 20) planned for that area under the proposed action (see Figure 2.1) would be relocated to the Building 1180 site; and
3. Two duplex cottages (Buildings 1 and 2) located on the ridge overlooking Pali Kilo Beach in the proposed action (see Figure 2.1) would be eliminated because the EU complex would be located at this site.

As under the proposed action, Building 1180 would be demolished and its equipment relocated to a new building constructed at an open lawn area along D Street across from Building 242 as part of this alternative.

No-Action Alternative. MCCS would not construct additional cottages or the EU complex within the Pali Kilo area. MCCS would continue operating *The Cottages at Kaneohe Bay* using the existing 13 cottage units.

2.2 Framework for Alternatives Development

The framework used in developing the conceptual site plan for the proposed action along with eliminating other alternatives considered consists of the following primary factors.

1. Viewsheds
2. Site topography
3. Historic and cultural resources
4. Operational safety hazards
5. Training areas
6. Floodplain

These factors were used in developing alternative siting locations for the new cottages and particularly the EU complex. Ocean views were critical to the proposed action's economic feasibility because it would make new recreational lodging units more attractive to rent to guests. However, other environmental and operational factors also influenced the building siting. The main difference in the alternative site plans developed and evaluated were associated with siting the EU complex.

Viewsheds/Proximity to Shoreline. Panoramic views of Kaneohe Bay and the Koolau Mountain Range are available from many vantage points within the project area. These views, its proximity to the shoreline providing oceanfront views, having closer direct access to the shoreline are what makes the existing cottages so popular, and were important factors in siting additional units under the proposed action.

Site Topography. Existing site topography was assessed and evaluated to orient new cottages and the EU complex to provide ocean or partial ocean views. Open areas with more level site conditions were considered versus steeper sloped areas to minimize the amount of ground disturbance. Cottages would be constructed using posts and piers mounted on poured-in-place concrete footings to minimize ground disturbance and maximize view potential.

Historic and Cultural Resources. Areas with known historic sites based on previous archaeological studies were identified and avoided. An archaeological inventory survey was conducted to identify any as yet undiscovered historic sites present in the areas being considered for new cottages and the EU complex. These sites have been identified, and this document addresses potential impacts of the action alternatives to historic and cultural resources.

Operational Safety Hazards. An existing ordnance assembly area is located at the northern point of the MCB Hawaii Kaneohe Bay's West Field, southwest of the project area. All of the existing cottages are located outside the Explosive Safety Quantity Distance (ESQD) arc generated from this building. At the southern end of the project area, there is a smaller ESQD arc that generally extends to the edge of the project area. All of the existing cottages are outside this arc (Building 6171 is the closest). Siting the new cottage units outside the ESQD arcs were factors considered in the development and evaluation of site alternatives.

Training Areas. A number of areas within the Base are regularly used for training, including the Marine Air Control Squadron (MACS) II Training Area that encompasses a large area generally located east of Mokapu Road and inland of Pyramid Rock Beach. Training conducted in this area includes amphibious landing exercises at Pyramid Rock Beach requiring periodic beach closures. An approximately 300-foot buffer around this general training area was observed to minimize potential conflicts, and Mokapu Road was used to define the western boundary of the training area buffer.

Floodplain. Existing floodplain areas extend inland over portions of the Pali Kilo coastal area, and this information was used in developing and evaluating alternatives for the siting of new buildings. The project area includes predominantly Zone VE designated areas that are subject to inundation by the one-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. A portion of the south end of the project area is designated Zone AE which are areas subject to one-percent-annual-chance of coastal or inland flooding. The feasibility and practicability of siting new buildings outside the floodplain line were evaluated in relation to the project need and objectives. Where new buildings were sited within a portion of the floodplain, flood conditions would be mitigated by minimizing building footprints and incorporating appropriate design measures (e.g. elevating structures).

2.3 Description of the Proposed Action and Alternatives

2.3.1 Proposed Action

The proposed action is also identified as the Building 1180 EU Option, and this alternative consists of constructing up to 19 new cottages (single or duplex cottages) and a 14-unit EU complex, totaling 49 new lodging units within the Pali Kilo project area. Three of the cottages would be single units and 16 cottages would be duplexes. These cottages would be located west of both Palikilo Road and Mokapu Road, and between Pali Kilo Beach to the south and Building 1607 (Presidential Cottage) to the north.

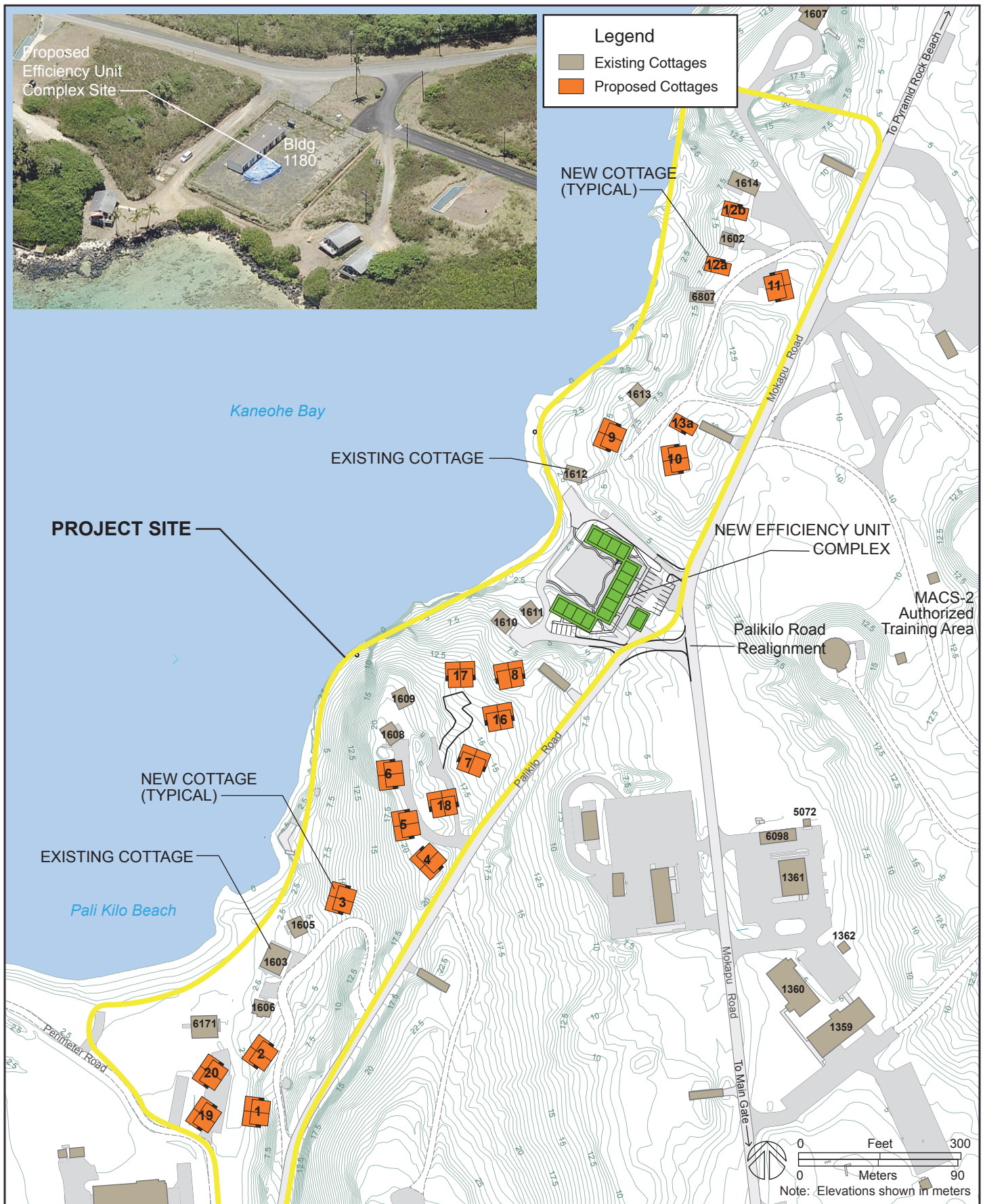
The existing Building 1180 (used for emergency generators and other portable equipment storage) and its 0.44-acre site would become the site of the new EU complex. Figure 2.1 shows the conceptual site plan for this proposed action. The portable equipment stored in Building 1180 would be relocated to a new facility to be constructed on an open lawn area along D Street, across from Building 242 at the southern section of the Base. Building 1180 would subsequently be demolished.

Visitor occupancy rates and characteristics of the new 2-bedroom units are expected to follow MCCS's existing Pali Kilo units (average 2.8 persons per 2-bedroom unit comprised of couples or families with one or two children). MCCS normally limits maximum occupancy of the 2-bedroom units to six persons. The EU visitors are expected to have similar characteristics with a higher number of couples given the studio configuration.

MCCS plans to incorporate "green" elements into the design of new buildings along with site development. Proposed construction is intended to comply with a minimum Leadership in Energy and Environmental Design (LEED) Silver certification. Examples of green elements that may be considered for site development include low impact development erosion and sedimentation plans, reducing paved areas for parking and driveways using grasscrete or other pervious products.

Duplex Cottages

A total of 16 duplex cottage buildings are planned, which would create 32 two-bedroom lodging units. The general design character and scale of the duplex cottages would be similar to existing Cottage 6171, the newest of the existing cottages constructed prior to 2000. This duplex cottage is very popular, and appears to be adequately sized for the needs of most guests. New duplex cottages would be single-story with a footprint of about 2,600 square feet.



Proposed Action (Building 1180 EU Option)

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Figure 2.1

Each unit has two bedrooms (one bed per bedroom), one bath, a kitchen, and a floor area about 800 square feet in size. Each unit also features a large private deck of about 300 square feet to enjoy views of the shoreline. The building's foundation would be constructed on posts and piers anchored to a poured-in-place concrete foundation (similar to Building 6171). Figure 2.2 presents the Building 6171 floor plan along with photos of existing buildings similar in concept to the size and scale of new duplex cottages being proposed. The actual design of additional cottages would be developed during the project's design phase, and may differ from Building 6171 but maintain the same building envelope. Parking for two vehicles is planned for each two-bedroom unit (four stalls per duplex cottage).

Single Cottages

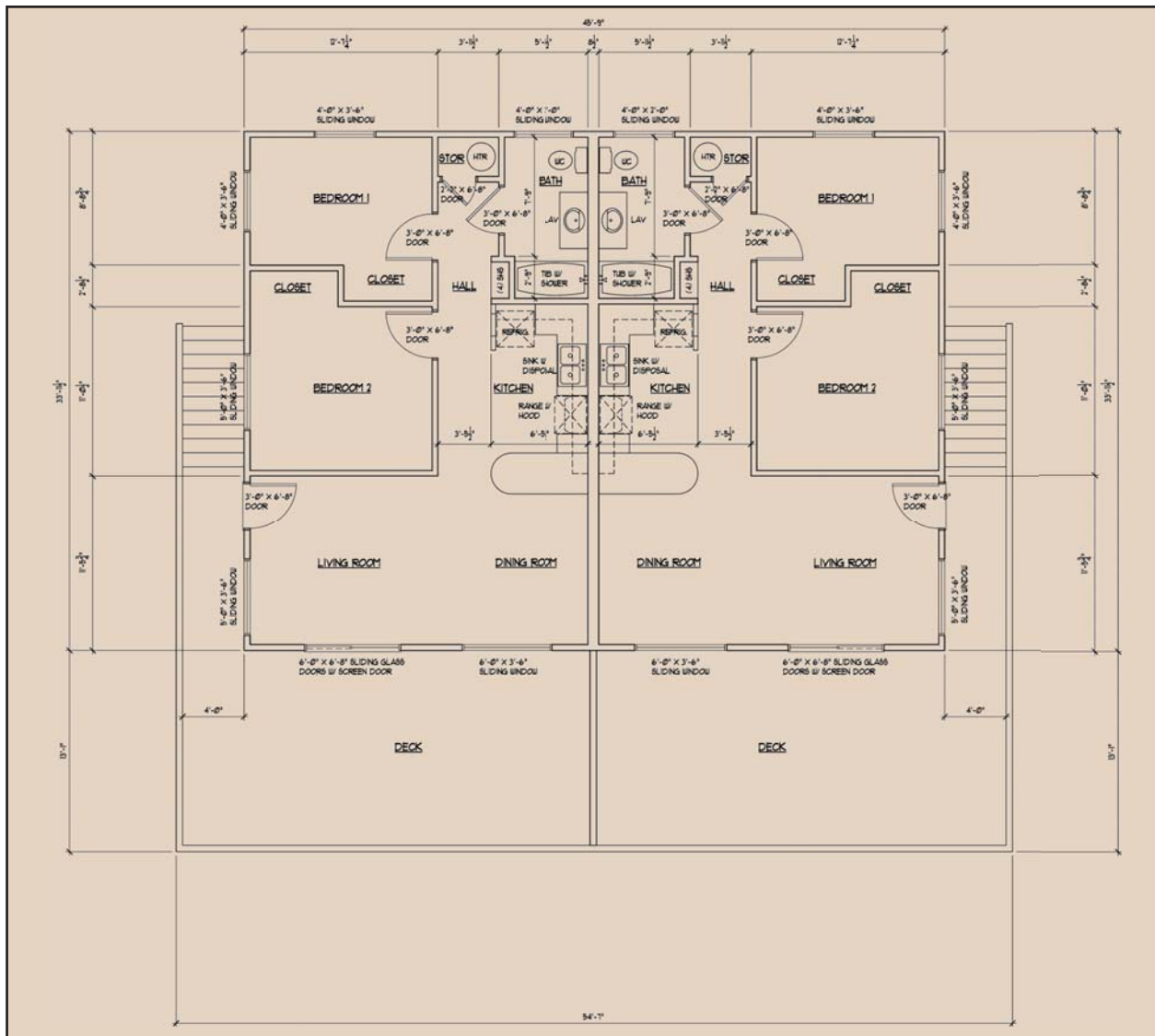
Three single cottage buildings are planned creating three additional two-bedroom lodging units. The design character and scale of the single cottage buildings would be similar to existing single cottages. These are single-story, light wood frame buildings with a footprint of about 950 to 1,050 square feet. These buildings would have two bedrooms (one bed per bedroom), one bath, a floor area of about 700 to 800 square feet, and a large open deck of about 250 square feet to enjoy views of the shoreline. Building foundations would be constructed on posts and piers anchored to a poured-in-place concrete foundation. Parking for two vehicles is planned for each single cottage building.

Efficiency Unit

The EU complex would consist of a cluster of single-story buildings providing a total of 14 studio units, along with a separate maintenance building. The studio units would have one bath, a kitchenette, and a floor area of about 450 to 500 square feet. Figure 2.3 shows a partial floor plan of another transient lodging facility to conceptually show what these EU studio units may look like. The maintenance building would be used for housekeeping, an administrative office, and storage area. The buildings have been configured in a U-shape to provide ocean or partial ocean views for each studio unit. This would allow for a common area that could serve as a grassed courtyard replacing much of the existing concrete pad supporting Building 1180.

Portions of the EU building would be located within the coastal high hazard VE zone to maximize ocean or partial ocean views from units and create a more desirable open air environment (Figure 2.1). The buildings would be designed to be elevated and meet floodplain design requirements. Off-street parking for this EU complex would have a minimum of one stall per unit, including a stall accommodating American Disabilities Act (ADA) requirements and an extra stall for guests, which totals 15 parking stalls overall.

The final design of the cottage buildings and EU complex would be developed by MCCS during a future design phase as the construction of buildings is implemented. Therefore, some minor modifications to the size and design character of these buildings may occur within the design envelope. The design envelope includes a buffer zone for landscape, walkways, and utilities. For example, the project area is being proposed as a historic district due to the cultural history and historic occupation of the area as evident by former house lot remnants present and preserved as historic sites. Consequently, new



Representative Duplex Cottage Floor Plan
(Existing Cottage 6171)



Oblique Aerial View of Existing Cottage 6171



Photo of Existing Duplex Cottage (6171)

Duplex Cottage Representative Floor Plan

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Figure 2.2

Figure 2.3

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

buildings could reflect a design character reinforcing the historic and cultural history of this area. The configuration of EU buildings could be modified as well to improve views, efficiency of operation, adjust for site conditions, etc.

Access driveways and supporting utilities such as electrical power, communication, potable water, and sewer collection would be constructed connecting new buildings with the existing systems serving the area. Drainage improvements consist of managing surface runoff from building footprints, similar to existing cottages. Most of the existing pavement and concrete slab at the Building 1180 site could probably be removed based upon the final design, and replaced with landscaping (e.g., courtyard) to improve drainage and ground infiltration. As appropriate, pathways would be identified during the design phase of this project.

Building 1180 Relocation

Coordination within MCB Hawaii has been conducted to determine the appropriate location for constructing a new building to store relocated equipment from Building 1180 at its current site at the Pali Kilo coastline area. A 10,000 square foot, open lawn area along D Street across from Building 242 has been selected as the relocation site. This site is located in the southern section of the Base; Exhibit 2.1 provides an aerial photograph of the proposed relocation site.

This site was chosen due to its proximity to the MCB Hawaii Kaneohe Bay Facilities Department's area and current available space. MCB Hawaii would coordinate with the Facilities Department to determine more specifics associated with this equipment relocation and new building construction such as NEPA compliance, building and site design improvements, and its implementation. As already discussed, Building 1180 is used to store emergency generators and other portable equipment and is about 1,600 square feet in size. The relocation site is large enough to accommodate a new building for equipment relocation.



Exhibit 2.1 - Aerial Showing Proposed Building 1180 Relocation Site

2.3.1.1 Modifications to Proposed Action

During Section 106 consultation conducted for this project under the National Historic Preservation Act of 1966, as amended (16 USC §470), MCB Hawaii determined that several cottages along with a portion of the EU Complex would have resulted in an adverse effect on historic properties present. MCB Hawaii thus decided to reduce the number of cottages and EU Complex units as a means of mitigation to avoid

these historic properties that were identified based upon the results of an archaeological inventory survey.

This modification to the proposed action would construct only 12 cottages and a 10-unit EU Complex. The EU complex would also be re-configured to an L-shape layout. A total of 33 units (duplex and single cottages and EU Complex) would now be implemented under this modification. This is a reduction of 16 units (12 cottage units and four efficiency units) from the originally proposed 49 units. All of the cottages initially planned in the area north of the Building 1180 site would be eliminated. Cottage No. 6 on a bluff overlooking the coastline would be eliminated, and Cottage No. 3 would be changed to only a single cottage instead of a duplex. The southern wing of the EU complex would also be eliminated.

MCB Hawaii determined that reducing the number of cottages and Efficiency Units would result in “no adverse effect” on historic properties because these sites could be avoided. Concurrence with this determination was received from the State Historic Preservation Officer, and is discussed in more detail in Chapter 3.13.

2.3.2 Pali Kilo Beach EU Alternative

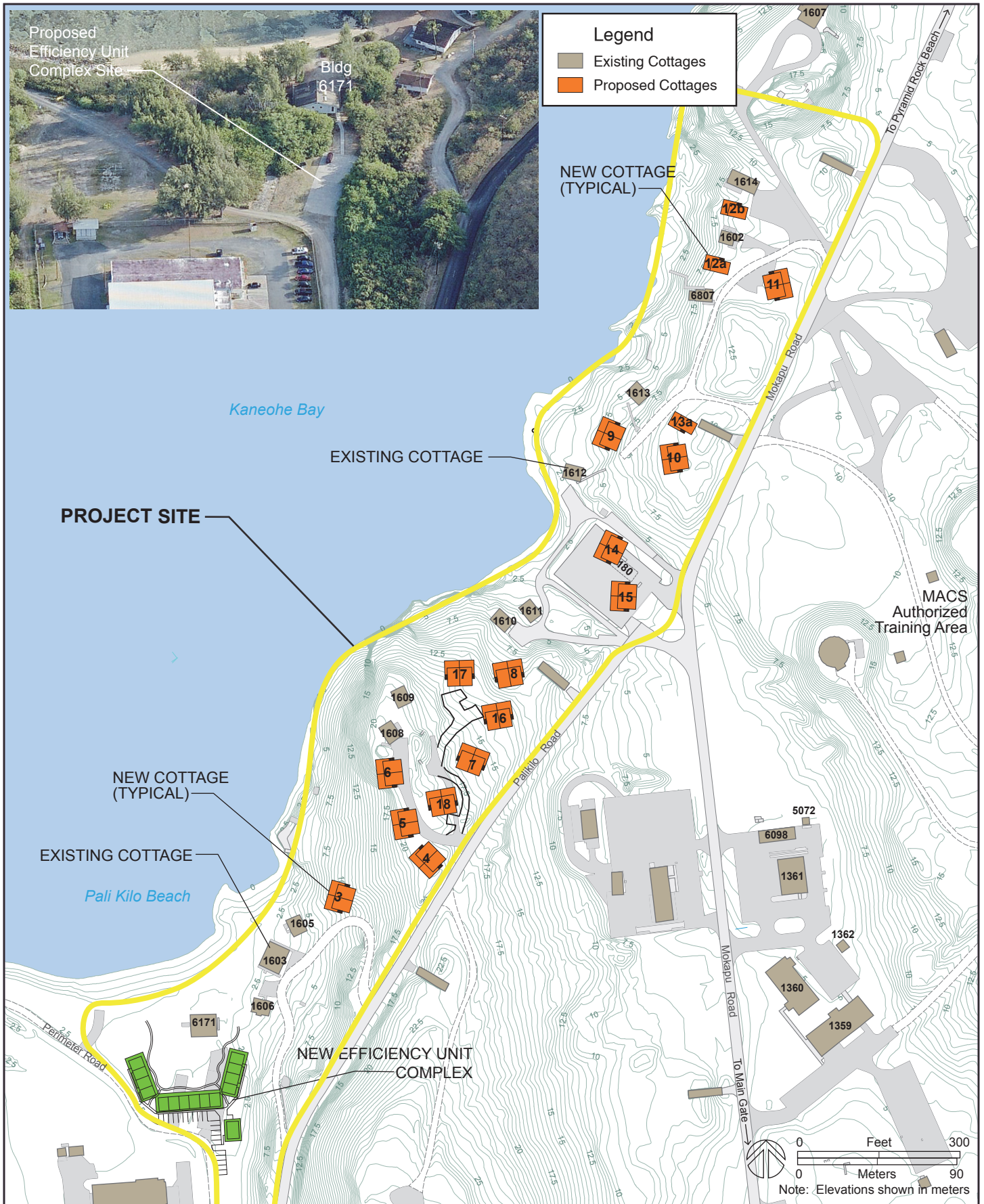
The Pali Kilo Beach EU Alternative is a variation of the proposed action with up to 45 new lodging units constructed in the same general configurations as the proposed action. MCCA would add 31 cottage units (in 17 separate single or duplex cottages) and the EU complex (14 studio units). The main differences with the proposed action are:

1. The EU complex would be situated at a site inland of Pali Kilo Beach behind existing cottage Building 6171 instead of north at the Building 1180 site;
2. Two duplex cottages (four units) planned for the Pali Kilo Beach area under the proposed action would be relocated to the Building 1180 site; and
3. Two duplex cottages (four units) located on the ridge overlooking Pali Kilo Beach would be eliminated because of the EU complex.

Accordingly, this alternative would have four less lodging units than the proposed action. Figure 2.4 shows the conceptual site plan for this Pali Kilo Beach EU Alternative.

Site Plan Components

The general design character and scale of duplex cottage buildings would be similar to the new buildings planned under the proposed action. Figure 2.2 previously showed a floor plan and photos of a duplex cottage (Building 6171) to provide a conceptual framework of the size and scale of the new cottages. The design character and scale of single cottage buildings would also be similar to new single unit buildings planned under the proposed action.



Pali Kilo Beach EU Alternative

MCB Hawaii Kaneohe Bay
 Pali Kilo Cottages Expansion Project

Figure 2.4

The EU complex would be similar to that under the proposed action (i.e., 14 studio units comprised in a cluster of three buildings with a separate maintenance building). The EU complex is shown in a U-shape for illustrative purposes but would be designed and configured to provide ocean or partial ocean views for each studio unit of the Pali Kilo Beach area to provide an attractive and open space setting. Although portions of the buildings would be located within the VE zone, the structures would be designed to be elevated to meet regulatory floodplain design requirements. Off-street parking for this EU complex would include a minimum of one stall per unit, an additional stall accommodating ADA requirements, and several stalls to meet guest and loading requirements for a total of 20 parking stalls.

As with the proposed action, the final design of these cottage buildings and EU complex would be developed by MCCA during a future design phase as the construction of buildings are implemented. “Green” elements are planned for incorporation into the design of new buildings and site development, and the designs are intended to comply with a minimum LEED Silver certification. Therefore, some minor modifications to the size and design character of these buildings may occur within the design envelop along with changes to the configuration of EU buildings to improve views, efficiency of operation, adjust for site conditions, etc.

This alternative also allows MCB Hawaii the flexibility to decide not to relocate the existing Building 1180. Not relocating Building 1180 would result in four less potential units, but would save costs associated with Building 1180 demolition and construction of a new building to store relocated equipment.

2.3.3 No Action Alternative

The No-Action Alternative involves not constructing any new cottages or the EU complex within the Pali Kilo project area and continuing use of the existing 11 cottages (13 units). MCCA would continue to have difficulty meeting the current use demand, continue turning away a high volume of requests, and maintain a long wait list. The No-Action Alternative would also result in MCCA failing to properly plan for projected future demand.

Under the No-Action Alternative, the existing facilities would not meet the MCCA mission objective outlined in the MCCA 2025 Plan of being unparalleled in terms of their capability to provide effective and efficient services. MCCA would not be able to effectively support promoting the overall morale and welfare for personnel. This situation would make it difficult for MCCA to meet their primary mission, which is to take care of Marines and their families.

The No-Action Alternative would not meet the purpose and need for the proposed action or the project objectives. As a result, this alternative would not be implemented; however, it is carried through the EA analysis to satisfy CEQ requirements. This alternative represents a future scenario “without the project” that provides a baseline of future environmental conditions to assess and evaluate probable impacts or changes resulting from the proposed action and Pali Kilo Beach EU Alternative.

2.3.4 Alternatives Considered But Eliminated From Detailed Study

Alternatives that were initially considered and eliminated from further consideration are presented in this section. These alternatives were eliminated because they did not adequately address the project need, meet project objectives, conflicted with the major factors considered in the site plan development, or would have the potential for greater environmental impacts.

Several other alternative conceptual plans focusing on alternative EU complex locations were developed, evaluated, and eliminated from further study. The single and duplex cottages locations were selected based on pre-established siting criteria and were generally similar to that of the proposed action. These alternatives consist of the following:

1. **Palikilo Road EU Alternative.** Constructing the EU complex along Palikilo Road about 100 feet south of the road's intersection with Mokapu Road on an elevated rise. This alternative was eliminated because it would be located further inland (west) away from the coast and only provide limited (seven) studio units with ocean views making rental of the remaining units less desirable and less economically feasible to operate. The building would have a strong visual presence on a hill along the road and negative impact to the visual character of that area. Site preparation and development costs for this complex at this site would also be greater due to the sloped terrain of that area.
2. **Pyramid Rock Beach EU Alternative.** Constructing the EU complex in an open area off Mokapu Road further inland (south) of the Pyramid Rock Beach parking lot. The area is about 400 feet north of the intersection of Palikilo Road with Mokapu Road. This alternative provided convenient access to Pyramid Rock Beach, but was eliminated because it provided fewer ocean view studio units making rental of the remaining units less desirable and less economically feasible to operate. The site also encroached into a training area buffer resulting in potential conflicts. Another concern was that use of the site would eliminate its use as overflow parking from Pyramid Rock Beach that frequently occurs on weekends and during periods of large surf.
3. **Mokapu Road Area EU Alternative.** Constructing the EU complex in an open area just south of the intersection of Palikilo Road with Mokapu Road to avoid training concerns associated with the encroachment of the Pyramid Rock Beach EU Alternative into the training area buffer zone. This alternative was eliminated because it would not provide any desirable ocean views or even partial ocean views, making rental of the units less desirable and not economically feasible to operate. The complex is sited next to a road intersection and near operations facilities which is a less desirable setting when compared to other preferred sites closer to the ocean along the Pali Kilo coastline.
4. **Building 1180 Constrained EU Alternative.** This Alternative is similar to the proposed action in that the EU complex would be constructed within the Building 1180 compound. The primary difference is that this alternative keeps all buildings outside of the VE zone that extends into this area. The VE zone and historic properties (possible habitation) present to the north and south severely constrain the available area to accommodate the EU complex.

This alternative was eliminated because it would only provide half of the total studio units with ocean views making rental of the remaining half of the complex's units less desirable and less economically feasible to operate.

5. **Pali Kilo Beach Constrained EU Alternative.** This Alternative is similar to the Pali Kilo Beach EU Alternative being studied in the EA. The primary difference is that like the above alternative, it keeps all buildings outside of the VE zone that extends into this area. This alternative was eliminated for similar reasons in that it would only provide half of the total studio units with ocean views making rental of the remaining units less desirable and more difficult to operate economically.

2.4 Environmental Consequences of the Proposed Action and Alternatives

Table 2.1 summarizes the environmental consequences of the proposed action and other alternatives evaluated under this assessment. The information in the table is discussed in greater detail in Chapter 3, Existing Environment and Environmental Consequences.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
3.1 Geology, Topography, and Soils: Geology and Topography	Site topography limits where buildings footprints, walkways and driveways can be located. No major cut or fill activities are proposed, and building foundations would be constructed on post and piers mounted on poured in place concrete bases. Utility connections would have short-term minor effect. The design phase would allow for more detailed site evaluations to minimize potential siting impacts. EU Complex location at the developed Building 1180 site would have minimal impacts on topography and will be constructed using open foundation design.	Similar to proposed action. EU Complex location at Pali Kilo Beach would have minimal impacts on topography and similarly have open foundation design.	No change.
Soils	Potential soil erosion and sedimentation from vegetation removal and other construction activities would be avoided and/or minimized through construction period by best management practices. The sites would be re-vegetated with native plants (>50%) to further mitigate effects and create a more sustainable landscape. The Building 1180 site would be demolished and redeveloped with a higher proportion of pervious surfaces, improving the quality of storm water runoff and reducing runoff volumes.	EU Complex at Pali Kilo Beach would increase impervious surfaces because it would affect more area that is currently pervious (trees and vegetation).	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
3.2 Natural and Man-Made Hazards:			
Natural Hazards (Earthquake, Tsunami, and Hurricane)	Susceptibility to damage from an earthquake, hurricane, or tsunami similar to other structures and buildings in the surrounding area. Buildings to be designed in accordance with DOD Unified Facilities Criteria.	Similar to proposed action.	No change.
Natural Hazards (Flooding)	New cottages sited outside the VE Flood Zone. A modification to the proposed action reduces the number of cottages and eliminates the south wing (4 units) of the EU Complex (eliminated under Section 106 consultation process). The building layout of a smaller EU Complex can be sited outside the VE Flood Zone, and would not impact floodplain values.	The EU would encroach into the VE zone at Pali Kilo Beach, and would need to be elevated above the base flood elevation and use an open foundation design.	No change.
Man-Made Hazards	New cottages and EU Complex sited outside of man-made hazard areas (ESQD arcs, accident zones, etc.).	Similar to proposed action. EU Complex location is closer to ESQD arcs than proposed action.	No change.
3.3 Air Quality	No long-term impact on air quality in the surrounding area. Minor short-term impacts from construction-related activities. A dust control plan or other BMPs to be incorporated in design.	Similar to proposed action.	No change to short- or long-term air quality.
3.4 Noise	No significant long-term impact on ambient noise levels. Minor short-term noise impacts from construction-related activities.	Similar to proposed action	No change.
3.5 Terrestrial Resources	No significant short- or long-term impacts on botanical resources. None of the vegetation within the area of proposed building footprints is known to be Federal or State-listed threatened or endangered, or candidate threatened or endangered botanical species. Landscape plans prepared as part of the project's design would comply with Base orders. Construction of the EU Complex at the Building 1180 site would have a positive impact due to landscape restoration that could replace some existing paved areas.	Similar to proposed action except that the Pali Kilo Beach site for the EU Complex is currently in a more naturalized state with strand-type vegetation that would need to be partially removed and replaced with impervious surfaces (buildings and pavements). Some existing vegetation and several trees	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
		would need to be removed.	
3.6 Visual Resources	The project site viewshed is very localized – confined to a several block radius around Palikilo and Mokapu Roads, and some intermittent shoreline view planes (i.e., not visible from public vantage points such as public parks and public roads). The addition of new cottages and the EU Complex would alter the present visual character within the viewshed. New cottages added to the small knoll along Palikilo Road would be visible to visitors along Palikilo and Mokapu Roads, changing the landscape from natural hillside to partially developed hillside. No publicly protected view planes would be affected and therefore changes would not have a significant adverse impact on visual resources. The EU Complex at this location would be more visible than the Pali Kilo Beach location, and would change the character of the Building 1180 site from industrial to residential. Landscaping would reduce and soften views.	Similar to proposed action. New cottages added to the small knoll along Palikilo Road would be visible to local visitors along Palikilo and Mokapu Roads, changing the landscape from naturalized hillside to partially developed hillside. Views of the EU Complex at Pali Kilo Beach would generally be screened by existing vegetation along Palikilo Road in that area.	No change.
3.7 Land Use Compatibility	No significant impact on land use within the project area would occur because the new cottages and EU Complex would be consistent with existing use and MCCS operations. Improvements would be consistent with the MCB Hawaii master plan that designated this area as “Community Facilities,” and identified the construction of additional cottages via infill (Project MC-9).	Similar to proposed action	No change to current land uses. However, this alternative would not be consistent with the MCB Hawaii master plan (Project MC-9; additional cottages via infill).
3.8 Infrastructure Facilities			
Water Supply System	Additional demand for potable water would be generated, but no significant impact to the local water system is anticipated.	Similar to proposed action, but slightly lower water demand due to four less units.	No change.
Wastewater System	Additional wastewater would be generated, but no significant impact to the local wastewater system is anticipated.	Similar to proposed action, but slightly lower wastewater generated due to four less units.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
Storm Drainage System	Additional storm water runoff would be generated due to increased impervious areas created. However, sustainability elements incorporated into design plans would try to achieve no net increase in discharges. Thus, any increase in runoff should be minimal and not have a significant impact on the surrounding area. A permeable surface for walkways, driveways, and parking areas associated with the Building 1180 EU site can be used to reduce storm water runoff and improve storm water quality from that site.	Similar to proposed action.	No change.
Solid Waste Disposal	Additional solid waste generated is not expected to have a significant impact, and would continue to be collected and disposed of at the Base's sanitary landfill.	Similar to proposed action.	No change.
Electrical and Communication Systems	Additional demand for electrical service would be generated; however, this increase is not expected to have a significant impact on MCB Hawaii's existing electrical or communication systems.	Similar to proposed action.	No change.
Roadway Facilities	Roadway use would increase due to additional vehicle trips generated; however, this increase is not expected to have a significant impact on roadway facilities. Most traffic generated by new guests would likely occur outside the typical weekday commuter peak hours and mid-day period at the runway crossing. MCCA can inform guests of mid-day conditions at the runway crossing to help avoid and minimize potential traffic congestion.	Similar to proposed action.	No change.
3.9 Recreational Resources	Additional guests would increase demand and use of MCB Hawaii Kaneohe Bay recreational facilities and resources (e.g., beaches). However, this should not have a significant impact on facilities and resources. Increased recreational use supports the MCCA objective of taking care of Marines and their families. MCCA would continue working with other MCB Hawaii departments to provide guests with informational materials to educate them about the sensitivity of resources and pertinent regulations. Conservation measures would also be implemented to minimize effects on the marine environment from recreational activities.	Similar to proposed action. The Pali Kilo Beach EU alternative would likely result in increased utilization of Pali Kilo Beach due to its proximity.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
3.10 Socio-Economic Environment	A few new permanent full-time jobs would be created having a relatively small but positive employment impact. Additional personal income would be generated for employees creating small additional tax revenues to the State. Short-term construction-related jobs would be created along with increased State tax revenues. Increase in the number of persons staying and participating in activities in the area should not have a significant negative impact on the socioeconomic conditions of the Base.	Similar to proposed action.	No change.
3.11 Surface Water and Water Quality	Additional storm water runoff would be generated due to increased impervious areas created. However, low impact design elements incorporated into design plans would try to achieve no net increase in discharges. Thus, any increase in runoff should be minimal and not have a significant impact on water quality. A permeable surface for walkways, driveways, and parking areas associated with the Building 1180 EU site can be used to reduce storm water runoff and improve storm water quality from that site.	Similar to proposed action, however, the EU site at Pali Kilo Beach would displace larger areas of presently pervious surfaces (vegetation and trees).	No change.
3.12 Marine Resources	The project has the potential to directly or indirectly effect the Hawaiian monk seal, green sea turtle, and hawksbill sea turtle by: 1) disturbances from human presence and recreational activities; 2) exposure to elevated noise levels during construction; and 3) exposure to sedimentation, wastes, and discharges. Direct effects, including construction noise, will be abated through the implementation of construction BMPs to protect water quality in nearshore waters. Preventative architectural and engineering design elements will ensure runoff is retained on-site over the long-term to avoid increased runoff into nearshore habitats. These species may be indirectly impacted by recreational activities, however, these protected species are highly mobile and able to avoid direct impacts from this type of disturbance. Passive human interactions and selection of appropriate fishing techniques that	Similar to proposed action.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
	do not harm protected species would be encouraged through MCCA outreach and enforcement efforts. For the long term, MCB Hawaii policy includes protective conservation measures that will ensure indirect impacts will be minimized. Conservation measures will be in place to prohibit the clearing of trees along the shoreline and creating of social trails. Therefore, the proposed action may affect, but is not likely to adversely affect protected species because effects would be insignificant.		
Essential Fish Habitat (EFH)	The nearshore area around the project's coastline has been designated as EFH for several management unit species (MUS). Construction activities could increase stormwater runoff and the potential for EFH and MUS on the reef flat to experience adverse impacts from sedimentation, wastes, and discharges. Construction BMPs will ensure that runoff is contained on site during construction activities to protect water quality of nearshore waters. Preventative architectural and engineering design elements will ensure runoff is retained on-site over the long-term to avoid increased runoff into nearshore habitats. Recreational activities along the Pali Kilo shoreline and on the nearshore reef flat has the potential to adversely affect EFH. However, these MUS are highly mobile and able to actively avoid impacts by snorkelers and swimmers. Corals could also experience impacts from sediment re-suspension. These impacts are expected to be temporary and minimal, and similar to natural processes that occur in this area from wave and tidal action. Conservation measures to minimize all potential long-term adverse impacts to EFH and MUS from recreational users will include improved education and outreach, and improved compliance with state and MCB Hawaii Kaneohe Bay regulations, and applicable environmental laws. Other conservation measures will prohibit the clearing of trees along the shoreline and creating social trails. Therefore, increased runoff over the long term that could carry	Similar to proposed action.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
	sediments, wastes, and discharges will be minimized and adverse impacts to EFH and MUS on the reef flat will be negligible. Consultation with the National Marine Fisheries Service (NMFS) was conducted by NAVFACPAC, which included a Biological Evaluation. NAVFACPAC determined that the project's impact area is terrestrial; however, future impacts to essential fish habitat are possible as a result of increased recreational activity in the nearshore marine environment. The proposed action may affect EFH, but effects will be minimal and insignificant because steps can be taken to minimize and avoid adverse effects on EFH. Concurrence of this determination was received from NMFS.		
Section 7 Consultation	Informal Section 7 consultation was conducted with both the U.S. Fish and Wildlife Service (FWS) and NMFS. Listed species within this area under FWS jurisdiction were the: 1) threatened green sea turtle (<i>Chelonia mydas</i>); and 2) endangered hawksbill sea turtle (<i>Eretmochelys imbricata</i>). Listed species under consultation with NMFS included the endangered Hawaiian monk seal (<i>Neomonachus schauinslandi</i>) in addition to the turtles. Direct effects related to construction of new cottages and the EU include impacts from human presence, disturbance from construction noise, and exposure to sedimentation, wastes, and discharges. Some construction activities may be far enough away from the shoreline and/or have topographic features that block direct effects from construction-related activities. Short-term construction-related effects would be mitigated through implementation of extensive BMPs. Indirect effects include disturbance from recreation activities that would be mitigated through outreach and education of guests, and by enforcement of MCB Hawaii Kaneohe Bay regulations governing these cottages.	Similar to proposed action.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
	Conservation measures proposed and BMPs are addressed in a Biological Evaluation. NAVFACPAC determined that this project “may affect, but is not likely to adversely affect” ESA protected species. Concurrence of this determination by both FWS and NMFS was received.		
3.13 Historic and Cultural Resources	Five small arms magazines are World War II-era historic sites within the project area (Facilities 702, 703, 704, 715, and 1231). These sites were previously evaluated in a historic building inventory, and MCB Hawaii has already met their obligations for undertakings affecting these facilities. The small arms magazines and inert storehouses will be left in-place and not modified during this project. Building 1180 was determined to not be eligible for listing in the NRHP. No archaeological sites or deposits have been identified in the area proposed for a new building to house the equipment from Building 1180. This location is also situated behind Facility 201 that’s determined to be eligible for listing in the NRHP. Construction of the new building on the rear (north) side is preferable, and will distract less from the building's overall historic setting. Six previously unknown archaeological sites and seven previously documented historic properties are within the project’s area of effect. Construction of improvements would have an adverse effect on some of the historic sites. Five proposed cottages situated north of the EU Complex (Cottages 9, 10, 11, 12a, 12b, and 13a) would directly affect or be constructed near historic sites 2883 and 5733. Construction of proposed Cottage No. 6 would impact Site 7722. The northern half of proposed Cottage No. 3 (duplex) would also impact Site 4610. Construction of four studio units associated with the southern wing of the proposed EU Complex at the Building 1180 site would impact Site 7724.	Similar to proposed action. However, construction of the EU Complex at Pali Kilo Beach would impact Site 7726. To mitigate impacts, 12 cottage units would not be constructed similar to the proposed action. In addition, the EU complex at Pali Kilo Beach would not be constructed. A total of only 23 cottages units would be implemented under this modified alternative. This was determined to have no adverse effect on historic properties because remaining cottages would avoid impact historic sites. Other mitigation, such as archaeological monitoring, would be implemented for these remaining cottages.	No change

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
	To mitigate effects, the number of cottages and EU Complex units will be reduced to avoid certain historic sites. Only 12 cottages and a 10-unit EU Complex (reduced from 14 units) that could also be re-configured in an L-shape design is proposed as mitigation. With this reduction, all of the cottages initially planned north of the Building 1180 site would be eliminated. Cottage No. 6 on a bluff overlooking the coastline would be eliminated, and Cottage No. 3 would be changed to only a single cottage instead of a duplex. The southern wing of the EU complex would also be eliminated. Therefore, a total of 12 cottage units and four efficiency units (16 units total) would be eliminated. This reduction in units reflects a modification to the Proposed Action concept. A total of 33 units (cottages and EU complex) would now be implemented. This modification to the proposed action was determined to have no adverse effect on historic properties because remaining cottages and the EU complex would avoid and no longer impact historic sites. Other mitigative measures, such as archaeological monitoring, would be implemented for these remaining cottages and EU complex.		
Section 106 Consultation	MCB Hawaii initiated Section 106 consultation with the State Historic Preservation Officer (SHPO), and determined that the proposed action, with the reduced number of cottages and EU units (without south wing of complex), will result in “no adverse effect” to historic properties based on the following: 1. The reduced number of proposed cottages are being sited to avoid impacting archaeological sites and deposits. 2. The bunkers (Facilities 702, 703, 704, and 715) are covered under the Program Comment for World War II and Cold war Era (1939-1974) Ammunition Storage Facilities, and the Navy and MCB Hawaii have already met their Section 106 requirements.	Similar to modifications to the proposed action with a reduced number of cottages. However, EU would not be constructed at Pali Kilo Beach.	No change.

Table 2.1 Summary of Environmental Consequences			
Resource or Issue (Section in EA)	Proposed Action (EU Complex at Building 1180)	Alternative 1 (EU Complex at Pali Kilo Beach)	No Action Alternative
	3. The area proposed for relocation of Facility 1180 was previously disturbed, and no archaeological sites or deposits have been recorded in this area. 4. The proposed relocation site for Facility 1180 is on the rear parking lot side of Facility 201, and will be minimally visible from the principle (front) side of the building. 5. Archaeological monitoring will be conducted in areas near archaeological sites or in areas with sand fill. If human remains are discovered, all work in the vicinity will stop and the remains will be stabilized and protected. Treatment will proceed under the authority of NAGPRA. MCB Hawaii determined that this modification to the proposed action with mitigation measures would have “no adverse effect,” and the SHPO concurred with this determination.		
3.14 Secondary and Cumulative Impacts			
Secondary Effects	No significant secondary effects on the physical or social environment in the project area should occur.	Similar to proposed action.	No change.
Cumulative Impacts	Proposed action should not contribute to significant cumulative impacts on the physical or social environment. Temporary minor cumulative impacts with nuisance effects from construction activities (proposed action and beach pavilion and bathhouse) could occur such as noise and fugitive dust. MCCA would be responsible for these projects, and could schedule construction work to minimize effects.	Similar to proposed action.	No change.
3.15 Unavoidable Adverse Effects	There are no adverse environmental impacts identified that cannot be avoided. There are also no unresolved issues.	Similar to proposed action.	No change.

This page intentionally left blank.

3.0 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental setting and addresses the environmental consequences of these action alternatives compared with the baseline conditions (No Action Alternative). Discussion of the existing environment establishes baseline conditions for environmental resources with the potential to be directly or indirectly affected by the action alternatives.

This chapter evaluates the probable direct, indirect, short-term, long-term, and cumulative impacts of the two action alternatives and No Action Alternative on relevant environmental resources. The Action Alternatives referenced in this chapter consist of the: 1) proposed action (Site 1180 EU Option); and 2) Pali Kilo Beach EU Alternative that is a variation of the proposed action. As described in Chapter 2, the main differences associated with the Pali Kilo Beach EU Alternative is that only 45 total lodging units would be built instead of 49 lodging units under the proposed action. This difference includes the following: 1) the EU complex would be situated inland of Pali Kilo Beach instead of at the Building 1180 site; 2) two duplex cottages (four units) would be located at the Building 1180 site; and 3) two of the proposed duplex cottages (four units) located on the ridge overlooking Pali Kilo Beach would not be built. As a result, impact differences between these two action alternatives would predominantly be due to the location of the EU, and such differences will be discussed, as applicable.

Climate

The State of Hawaii climate is relatively moderate throughout the island chain, although some differences in these conditions may occur from one location to another due to the mountainous topography associated with each island. Two seasons are recognized in Hawaii: summer (May through September) and winter (October through April). Annual and daily variation in temperature depends to a large degree on elevation above sea level, distance inland, and exposure to the trade winds. On Oahu, the Koolau and Waianae mountain ranges are oriented almost perpendicular to the trade winds, which account for much of the variation in local climatology. MCB Hawaii Kaneohe Bay is located in the windward lowlands climatic region that is characterized as being moderately rainy with frequent trade wind showers, and temperatures nearly uniform and mild compared to other regions on the island.

Oahu's temperatures have small seasonal variation such that the temperature range averages only 7 degrees between the warmest months (August and September) and the coolest months (January and February) and about 12 degrees between day and night. Historic data from a Kaneohe recording station shows annual temperatures range from a low of 71 degrees to a high of 83 degrees Fahrenheit throughout the year. Annual rainfall averages about 54 inches per year making this area dryer than other areas in the Windward District (WRCC, 2010).

Winds on the island are predominantly "trade winds" from the east-northeast except for occasional periods when "Kona" storms generate strong winds from the south. Wind speeds typically vary between 5 and 15 miles per hour providing relatively good ventilation much of the time. MCB Hawaii's peninsula is exposed to steady trade winds that typically occur approximately 75 percent of the time. Prevailing winds generally blow from the east and the northeast with an annual mean wind velocity of about 12 miles per hour.

3.1 Geology, Topography, and Soils

3.1.1 Affected Environment

Geology and Topography

Mokapu Peninsula was created by volcanic activity building cones of molten rock (lava) and steam-broken ash. Fluctuations in sea level caused by glacial activities alternately flooded and exposed the coastline, allowing thick limestone platforms and sediments to form from coral reefs that developed in the shallows between volcanic features during periods of lower sea stands. These platforms and sediments make up much of the relatively porous, calcareous land surface existing at Mokapu Peninsula today (MCB Hawaii 2001).

There are three remnant volcanic features that create visual landmarks in the otherwise flat peninsula: the tuff cone, Ulupau Head Crater (683 feet or 208 meters) on the northeast corner; the low lava flow outcrop Pyramid Rock (or Kuau) on the northwest shore; and the 378-foot (116- meters) cinder cone, Puu Hawaii Loa, located near the center of the peninsula (MCB Hawaii 2001). The white sand of the north shore of Mokapu Peninsula is remnant of hard-shelled marine organisms and the erosion of coral reef structures. Heleloa sand dunes, created by the prevailing trade winds blowing beach sand inland, fringe the north shore of Mokapu Peninsula.

The topography associated with the Pali Kilo project area generally slopes toward the ocean from inland areas in a northwest to west direction. Areas closer to the rocky shoreline have mild to moderate slopes, and there is a small hill on the southern half of the project area near Pali Kilo Beach. Elevations along this coastal area generally vary from high of about 57 feet (17 meters) above mean sea level (AMSL) along Palikilo Road to a low of 0 feet AMSL at the ocean. The top of the hill in this area rises to an elevation of about 65 feet (20 meters) AMSL. Ground elevations of the existing cottages range from 8 feet (2.5 meters) AMSL near Pali Kilo Beach to 65 feet (20 meters) AMSL in the hillside area overlooking Building 1180. Figure 3.1 shows existing elevations (in meters) to provide a sense of topographic conditions along this coastal area.

Soils

Soils in the Pali Kilo area include those from the following series: 1) Honouliuli; 2) Jaucas; 3) Molokai; 4) Rock Land; and 5) Fill Land. Figure 3.2 graphically shows the soils classification for this area based upon State Geographic Information System (GIS) data. Soil at the northern end of the project area consists of Rock Land while the southern end at Pali Kilo Beach consists of Fill Land. Areas between these ends are comprised of the remaining soil types. A description of this soil type based upon the SCS's *Soil Survey of Islands of Kaua'i, Oahu, Maui, Moloka'i, and Lāna'i, State of Hawaii* (SCS 1972) study is provided below.

Figure 3.1

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project



Existing Soils Map (Proposed Action)

Figure 3.2

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

1. **Honouliuli Clay, 2 to 6 Percent Slopes (HxB).** This series consists of well-drained soils in the lowlands along the coastal plains, and it developed in alluvium derived from basic igneous material. The representative profile of this soil is dark reddish-brown, very sticky and very plastic throughout. The surface layer is about 15 inches thick. The subsoil, about 19 inches thick, is very dark gray and very dark grayish-brown mottled clay. The soil is neutral in the surface layer and mildly to moderately alkaline in the subsoil. Permeability is moderately slow, runoff slow, and the erosion hazard is slight. Workability is slightly difficult because of the very sticky and very plastic clay.
2. **Jaucas Sand, 0 to 15 Percent Slopes (JaC).** This series consists of excessively-drained, calcareous soils that occur as narrow strips on coastal plans adjacent to the ocean. They developed in wind and water deposited sand from coral and seashells. The representative profile of this soil is single grain, pale brown, sandy, and more than 60 inches deep. The surface layer is dark brown resulting from accumulation of organic matter and alluvium. The soil is neutral to moderately alkaline. Permeability is rapid, runoff very slow to slow, and the erosion hazard is slight. Wind erosion is a severe hazard where vegetation has been removed. Workability is slightly difficult because the soil is loose and lacks stability.
3. **Molokai Silty Clay Loam, 15 to 25 Percent Slopes (MuD).** This series consists of well-drained soils on uplands, and they formed in material weathered from basic igneous rock. The representative profile of this soil has a surface layer that is dark reddish-brown silty clay loam about 15 inches thick. The subsoil is also dark reddish-brown silty clay loam about 57 inches thick and has prismatic structure. The soil is slightly acid to neutral. Permeability is moderate, runoff is medium, and the erosion hazard is severe. Workability is slightly difficult because of the slope that usually does not exceed 20 percent.
4. **Rock Land (rRK).** This land type is made up of areas where exposed rock covers 25 to 90 percent of the surface. Rock outcrops of mainly basalt and andesite and very shallow soils are the main characteristics.
5. **Fill Land, Mixed (FL).** This land type consists of areas filled with materials dredged from the ocean of hauled from nearby areas, garbage, and general material from other sources. This land type occurs mostly adjacent to the ocean, near Pearl Harbor, and in Honolulu.

3.1.2 Potential Impacts

Effects on Topography

Action Alternatives. The action alternatives would have an effect on the existing topography of the project area where the footprints of new cottage buildings are located along with associated walkways and vehicular driveways serving them. However, these changes are not expected to be significant because the building foundations for cottages would be constructed on posts and piers mounted on poured-in-place concrete bases, thereby minimizing the amount of ground disturbance. The EU is planned to be constructed using existing concrete slabs (Building 1180 site and parking area at Pali Kilo Beach) where possible and at existing grade. The EU's design phase would evaluate the structural

integrity of the existing concrete slab and determine whether other improvements are needed. However, no major cut or fill activities are anticipated that would significantly alter present topographic conditions of this EU project site at both locations being considered which are already predominantly level.

The planned cottages are sited at ground elevations similar to existing cottages. Many of the new cottages would be sited along paved or unpaved driveways or access roads serving existing clusters of cottages, and would therefore reduce the amount of disturbance associated with new driveways or utility extensions. The design phase for individual cottage buildings would also allow for existing site conditions to be evaluated to minimize impacts. The orientation of a building's footprint or specific location at a site may be modified during the design process to better match existing topography, and thereby avoid or minimize site disturbance.

Building 1180 Site (Proposed Action). Construction of the EU at the existing Building 1180 site would have minimal impact on existing topographic conditions because the site is already generally flat and paved with asphalt. The EU would be sited at about 10 to 15 feet AMSL. Restoration of this area through the removal of portions of the asphalt for open common areas and walkways and landscaping this area with grass and other native vegetation would have a beneficial effect.

Pali Kilo Beach EU Alternative. Construction of the EU at Pali Kilo Beach would similarly have minimal impact on existing topographic conditions because the site is generally flat, and there is an existing concrete pad area available for group parking.

No Action Alternative. The No Action Alternative would have no impact to the current topography of the area because the present site conditions would continue with MCCA operation of existing cottages.

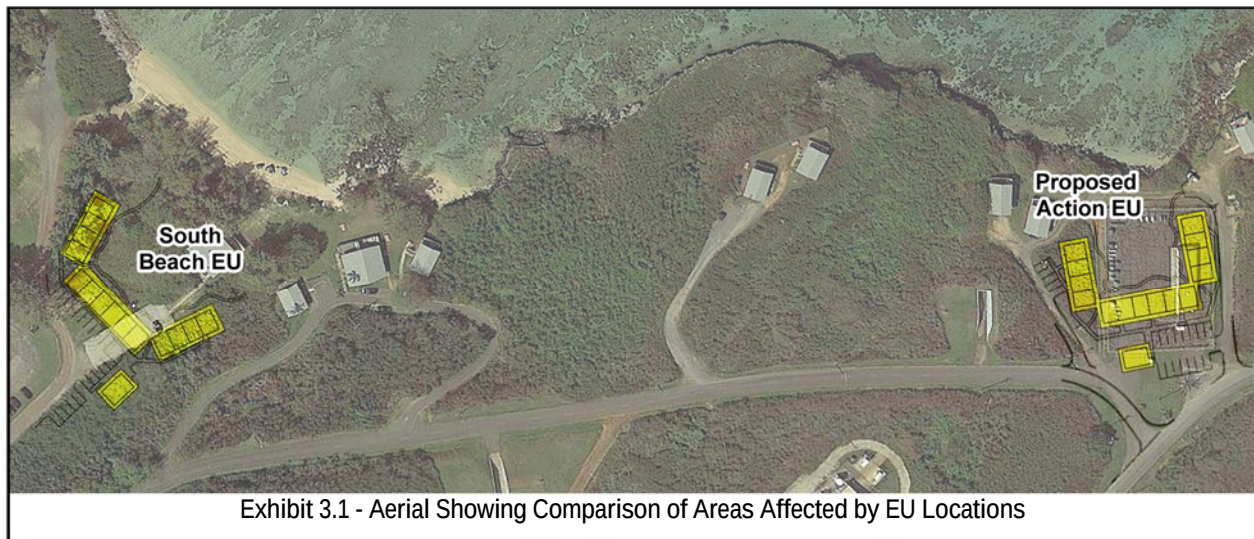
Effects on Soils

Action Alternatives. Construction of new cottages should not have a significant impact on existing soils in the project area such as causing large erosion of areas and sedimentation in coastal waters because there should not be any major cut or fill activities occurring. Cottage building foundations would be constructed on posts and piers minimizing alterations to topographic conditions and associated impacts on soils. Installation of utility connections would be determined during the design phase for cottages being implemented, and have a short-term effect from creating trenches for connections. The northern half of the project area contains rock land or soil types having only slight erosion hazard. Most of the southern half of the project area is Molokai silty clay loam that has medium runoff and a severe erosion hazard due to the steep slopes (15%-25%) associated with the hill. However, cottage buildings constructed on posts and piers would minimize ground disturbances to the steep slopes.

Removal of some vegetation of affected areas along with minor excavation would be required resulting in some disturbances of soil conditions. This would be associated with areas impacted by building footings, trenches for utility extensions, and extensions of existing driveways to access new cottages. Rock Land (rRK) soils are present at the northern-most area where new single-unit cottages 12a and 12b are proposed, but no exposed rock outcrops exist at the surface that would complicate construction.

The design phase for these individual cottages would determine appropriate design and construction measures to address soil conditions, and incorporate best management practices into construction plans. Landscaping with native plants would also be implemented in appropriate areas around new cottages to minimize the potential for soil erosion.

Proposed Action (Building 1180 Site). Construction of the EU under the proposed action should have a minor effect on soils because the site is already predominantly paved. This paved site would accommodate the majority of the EU building as shown Exhibit 3.1. Surrounding areas needed that are not paved were identified as consisting of Honouliuli clay that has moderate permeability and only a slight erosion hazard. Because a portion of this existing site is within the flood zone (VE designation), the EU would need to be elevated using a type of open foundation design because structural fill is prohibited in this flood zone. This open foundation design would similarly minimize grading activities needed at this site and effects on soil. The design phase for this EU would determine the appropriate foundation design (e.g., piles, columns).



Pali Kilo Beach EU Alternative. Construction of the EU at Pali Kilo Beach would also have a minor impact on soils that were identified as consisting of Fill Land (FL). This site has a paved parking area that would be used for the EU, however, most of the area affected (see Exhibit 3.1) would be unpaved as compared to the proposed action. A portion of this existing site is also within the flood zone (VE designation), therefore, the EU would need to be elevated using a type of open foundation design because structural fill is prohibited in this flood zone. This open foundation design would similarly minimize grading activities needed at this site and effects on soil.

No Action Alternative. The No Action Alternative would have no impact to the current soil conditions because the present site conditions would continue with MCCS operation of existing cottages.

Minimization Measures

Best Management Practices (BMPs) would be incorporated into the design of individual cottages and EU to minimize potential short-term impacts on soils (e.g., erosion) during construction activities. Low impact design elements (e.g., bioretention swales or basins) would also be incorporated into the design of new cottages and the EU to minimize or achieve no-net increase in discharges of storm water runoff. These measures would be developed during the design phase that includes site-specific assessments for buildings and utility connections, and would incorporate structural and non-structural measures as deemed appropriate to address storm water runoff. Erosion control measures considered may include, but not be limited to, the following: use of temporary silt fencing, sand bags, or screens; or thorough watering of disturbed areas after construction activity has ceased for the day.

The design of parking areas and pedestrian walkways can incorporate long-term measures to mitigate storm water runoff and erosion issues by using a permeable paver instead of asphalt or concrete, along with considering incorporating a soil retention system. Actual measures implemented would be developed during the final design of project improvements. Design plans would also be coordinated with pertinent MCB Hawaii departments for review and approval along with other applicable jurisdictional Federal and State agencies (e.g., State DOH), as required.

3.2 Natural and Man-Made Hazards

This section addresses natural hazards applicable to the project. Of the potential natural hazards, only earthquakes, hurricanes, and tsunami flooding hazards are applicable. Man-made hazards include air installation compatible use zones (AICUZ), ESQD arcs, and MCB Hawaii training areas.

3.2.1 Affected Environment

Earthquake Hazards

Except for the Island of Hawaii, the Hawaiian Islands are generally not situated in a high seismic area subject to numerous large earthquakes (Macdonald, Abbott & Peterson 1983). The largest seismic areas pertinent to the island of Oahu are the Molokai Seismic Zone and the Diamond Head Fault. The Diamond Head Fault passes through Koko Crater and extends along the seafloor northeast of Oahu. The Molokai Fracture Zone is an extension of a transform fault from the East Pacific Rise that extends from Molokai to the Gulf of California. This fracture is tectonic in origin and suspected to contribute to central region seismicity associated with an active seafloor (USGS 2002).

Most of the earthquakes that have occurred in the past have been volcanic earthquakes causing little or no damage to the other islands. Available historical data indicates that the number of major earthquakes occurring on Oahu have generally been fewer and of lower magnitude than those on other islands such as Hawaii. The U.S. Geological Survey's *Atlas of Natural Hazards in the Hawaiian Coastal Zone* (USGS 2002) assigned seismic hazard intensity ratings for all islands on a scale from 1 to 5 with 1 representing lowest hazard and 5 the highest. The southern half of Oahu extending from Makaha east around Diamond Head and Makapuu Head and north up to Kaneohe Bay was assigned a

volcanic/seismic risk ranking of 3 due to the proximity to the Molokai Seismic Zone (USGS 2002). MCB Hawaii Kaneohe Bay therefore has a risk ranking of 3.

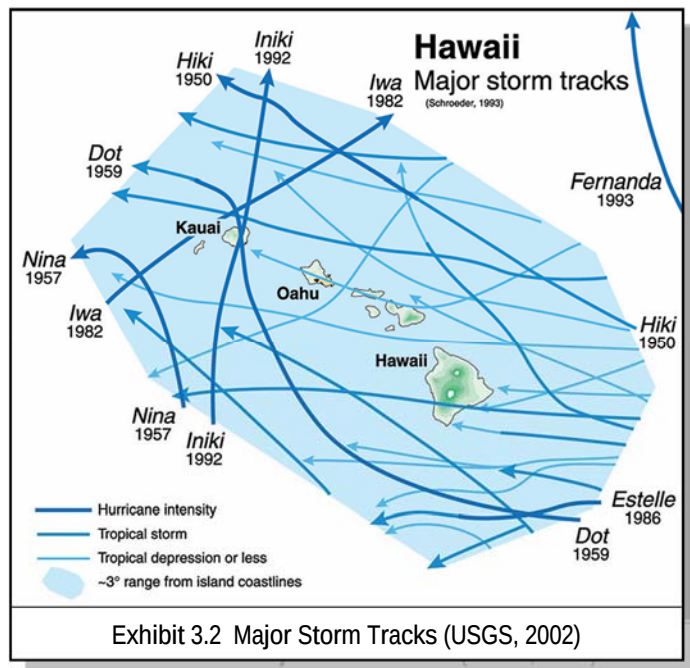
Tsunami Hazards

The coastal areas of the Hawaiian Islands are under the continuous threat of tsunami inundation because this region is one of the most geologically active regions on Earth. The geography of the shoreline often plays an important role in the form of the tsunami. Tsunami waves may be very large in an embayment, actually experiencing amplification in long funnel-shaped bays. Fringing and barrier reefs appear to have a mitigating influence on tsunamis by dispersing the wave energy (USGS 2002).

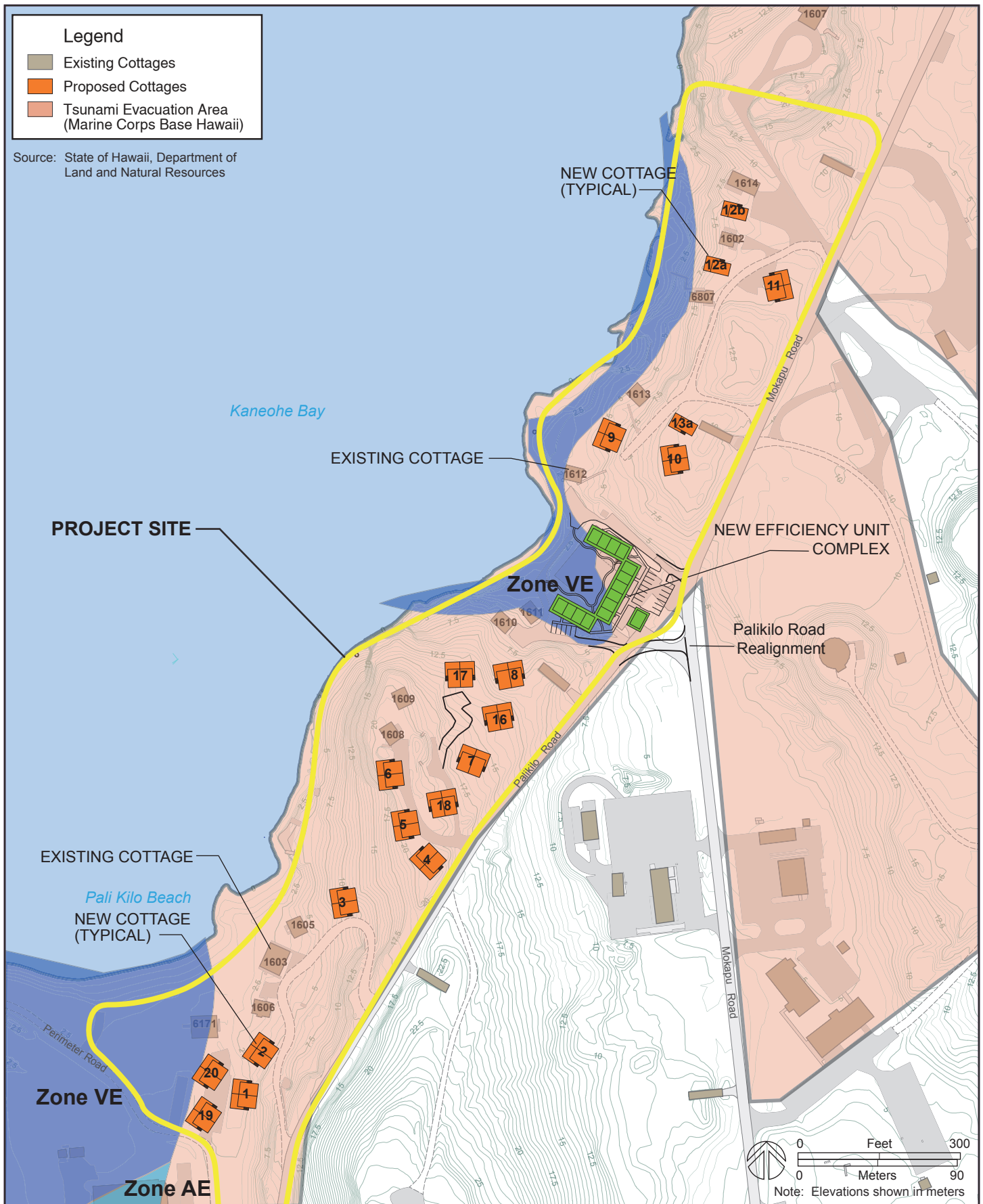
Tsunami evacuation areas have been established within MCB Hawaii under the Base's master plan. The evacuation map for the Pali Kilo area generally includes shoreline areas up to Palikilo Road and Mokapu Road. Inland areas above these roadways are also identified as evacuation areas (NAVFAC Hawaii 2006). As a result, the entire project area is located within this evacuation zone. In March 2011, the Tohoku tsunami was generated from a large earthquake generated off of Japan which caused damage to coastal areas on Oahu, although no damage to the Pali Kilo cottages is known to have occurred. Figure 3.3 shows the boundaries of this evacuation area.

Hurricane Hazards

Between 1970 and 1993, 105 tropical cyclones were identified in the central Pacific region resulting in an average of 4.5 storms per year. Not all of these storms directly passed thru the State, and actual hurricane strikes on the Hawaiian Islands are relatively rare in the modern record. More commonly, hurricanes that pass in close proximity of the islands generate large storm surge and swells and moderately high winds that cause varying degrees of damage. Impacts from these near-misses can be severe and lead to beach erosion, large waves, high winds, and marine overwash despite the fact that the hurricane missed the island (USGS 2002). Exhibit 3.2 shows the paths of hurricanes that affected the Hawaiian Islands between 1950 and 1993.



Hurricane evacuation areas have been established within MCB Hawaii under the Base's master plan. This evacuation area generally encompasses most of the project area, but includes less of this coastline than the tsunami evacuation area. Most of existing cottages are located within the hurricane evacuation zone, and all are within the tsunami evacuation area.



Flood Hazard Areas and Tsunami Evacuation Area (Proposed Action)

Figure 3.3

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Flood Hazards

Floods caused by heavy rainfall and strong winds normally occur during the winter months. Historic rainfall data for the Kaneohe area shows the most frequent rainfall occurs from November to April. Heavy rainfall can also be associated with the tropical storm and hurricane season between the months of June and October. Areas subject to recurrent rainstorm floods are generally the coastal plains and flood plains (USGS 2002).

The Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) for this project area is FIRM No. 15003C0280F (revised September 30, 2004). Figure 3.3 graphically shows the project area in relation to the FIRM. The FIRM map indicates that about half of the shoreline area is within the coastal flood zone with velocity hazard (wave action) (hereinafter referred to as Zone VE) with base flood elevations (computed elevation to which floodwater is anticipated to rise) of 14 feet to the north, 13 feet at the intersection of Palikilo Road with Mokapu Road, and 11 feet to the south at Pali Kilo Beach. Other areas within the project boundary are designated as Zone D (flood areas undetermined).

Existing Cottage 6171 constructed at Pali Kilo Beach in 2002 is partially located in the VE flood zone with a base flood elevation of 11 feet and ground elevations ranging between six feet to eight feet.² Base flood elevation at the existing Building 1180 site is 13 feet with existing ground elevations between eight feet closer to the shoreline up to 16 feet near Palikilo Road. Existing Cottage 1611 was constructed in 1985 and is also partially within the VE flood zone. The base flood elevation for this building is also 13 feet since it is situated near Building 1180, and ground elevations range from about 11 to 15 feet.

Man-Made Hazards

The Air Installations Compatible Use Zone (AICUZ) program identifies clear zones (CZ) and accident potential zones (APZ) due to aircraft operations associated with the nearby airfield. The Pali Kilo project area is not located within a CZ or APZ based. An APZ associated with a helipad for helicopter operations extends over the offshore area near the Pali Kilo Beach end of the project area, but this APZ does not extend onto inland areas (NAVFAC Hawaii 2006).

Explosive safety quantity distance (ESQD) arcs are established for ordnance storage and handling operations. The ordnance assembly area located at a northern point of MCB Hawaii's West Field generates an ESQD that extends across the bay towards the Pali Kilo coastline, but stops well short and does not encumber any existing or proposed cottages. There is also a smaller ESQD arc located at the southern end of the project area that generally extends to the limits of the operation's fence line.

² Siting of Cottage 6171 within the floodplain was subjected to an E.O. 11988 assessment process in 1997.

Existing cottage 6171 is the closest to these ESQD arcs. Other Buildings 706 and 707, shown on Figure 1.2, are located further inland and east of Palikilo Road. These buildings have smaller ESQD arcs that are considerable distances away from the Pali Kilo project area (NAVFAC Hawaii 2006).

An active training area encompasses the area east of Mokapu Road and inland of Pyramid Rock Beach. Occasional training exercises and operations are conducted in this area along with Pyramid Rock Beach resulting in the closure of this beach (e.g., Rim of the Pacific Exercise (RIMPAC) activities). A 300-foot buffer is maintained around this training area to minimize conflicts. Mokapu Road serves as a natural boundary for a buffer around this training area. The project area is located outside (on the western side of Mokapu Road) of this buffer area.

3.2.2 Potential Impacts

Action Alternatives. The risk of potential damage to the new cottages and the EU under the action alternatives from natural hazards would not be significantly different from the risk of damage to existing cottages or other building structures in the area. The entire Pali Kilo project area, including inland areas above Palikilo Road and Mokapu Road, is identified as a tsunami evacuation zone. Therefore, all guests and guests of cottages and the EU would need to be evacuated in the event of a tsunami threat. New cottages would be designed and constructed in accordance with Unified Facilities Criteria (UFC) building standards to minimize damages from seismic and wind-related natural hazards.

Proposed cottages along with EU sites under both action alternatives are situated outside of hazard or training areas associated with Base operations. New buildings are located northwest (seaward) of Palikilo Road and Mokapu Road that serve as natural boundaries and buffer areas from the training area behind Pyramid Rock Beach. The proposed cottages and both EU options are also outside of clear zones and accident potential zones from aircraft operations and ESQD arcs.

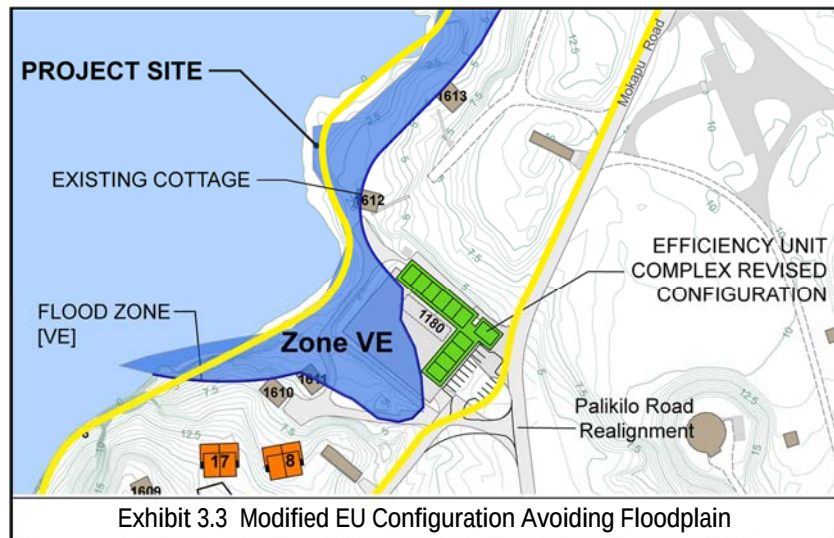
New cottages proposed under both action alternatives are sited outside the VE flood zone that extends into lower lying coastal areas of the project site. Several cottages are also located at higher elevations, well above the base flood elevations, and are therefore less subject to coastal flood hazards. The design for these cottages would not need to incorporate special design requirements.

The EU under both the proposed action (Building 1180 site) and alternative (Pali Kilo Beach site) would be partially located within the VE flood zone. The EU would thus be subject to potential impacts from flooding associated with storm surge. To avoid and minimize effects within the floodplain, an alternative configuration of the EU complex under the proposed action was subsequently developed.

Reconfiguration of EU. The design of EU complex was reconfigured to avoid impacts on historic properties (discussed further in Section 3.13).

Based upon the reduction in EU size by elimination of the south wing, the configuration of the EU at the Building 1180 site could be modified to avoid encroaching into the floodplain. Exhibit 3.3 shows this revised EU configuration.

Executive Order (EO) 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. The proposed action with modifications based upon the reconfigured EU complex complies with EO 11988 as development occurs outside of the floodplain.



Existing air quality within the project area is primarily affected by vehicle emissions in the form of carbon monoxide (CO), and, to a lesser extent, by natural sources (salt air from ocean breezes). Traffic along Palikilo Road and Mokapu Road is generally light, and there is no traffic congestion at that intersection generating increased concentrated emissions of CO. Aircraft operations in the vicinity would also generate some emissions such as carbon dioxide (CO₂) that would be dissipated by the prevailing tradewinds. Therefore, carbon emissions from aircraft operations and vehicular traffic do not adversely affect project area air quality.

3.3.2 Potential Impacts

Action Alternatives. Under the action alternatives, there should be no long-term impact on air quality in the surrounding area, and guest activities would not cause National or State Ambient Air Quality Standards to be exceeded. Minor short-term impacts on air quality from construction-related activities would predominantly be associated with fugitive dust emissions and to a lesser extent, exhaust emissions from on-site construction equipment. Fugitive dust emissions would generally arise from earth-moving activities associated with vegetation removal, site clearing, and related construction activities. Limited emissions are expected because construction would involve relatively minor ground disturbing activities since cottage buildings would be constructed on posts and piers mounted on poured-in-place concrete bases.

Construction of the EU building under the proposed action would utilize the existing concrete pad for Building 1180 where possible (Exhibit 3.1), and would need to be elevated and constructed using a type of open foundation design. Consequently, filling and other major alterations to the existing topography that typically generate greater fugitive dust emissions would not occur at this site, which is already relatively flat and graded.

The EU building constructed at Pali Kilo Beach would also need to be elevated and constructed using a type of open foundation design. Filling or other major alterations to the existing topography would not occur at this site, which is predominantly level. However, this site does have more vegetation than at the Building 1180 site (proposed action) that would need to be removed. Vegetation removal would result in more ground disturbing activities and fugitive dust emissions.

A Dust Control Plan would be prepared during the design phase and implemented by the contractor to minimize emissions of fugitive dust from construction activities. The plan may include, but not be limited to, a watering program or using wind screens. Other measures would include best management practices at the job site (e.g., road cleaning or tire washing program), and using gravel for bare areas used for access or operational areas when practicable. Further, engine exhaust emissions from construction vehicles can be minimized via the proper operation and maintenance of all equipment.

No Action Alternative. The No Action Alternative would not have short or long-term impacts on air quality because the present site conditions would continue with MCCA operation of existing cottages.

3.3.3 Clean Air Act

Action Alternatives. The action alternatives would similarly not include activities that would exceed NAAQS or State emission standards. Short-term construction activities would generate some fugitive dust emissions, however, such emissions should not exceed Federal and State standards and best management practices would be implemented to mitigate impacts further.

No Action Alternative. The No Action Alternative would not affect the NAAQS or State emission standards for regulated air pollutants because the present site conditions would continue with MCCA operation of existing cottages.

3.4 Noise

3.4.1 Affected Environment

Existing dominant noise sources within the project area consist of wind, aircraft operations, vehicular traffic, and human voices and activity. The most prevailing noise source is aircraft operations since vehicular traffic on roadways is light within the Base. Human voices associated with guests and recreational activities at the cottages are not a significant concern because these sounds would typically not surpass 65 decibels at the property line. MCCA regulations stipulate quiet hours at the cottages beginning at 10:00 p.m.

The MCB Hawaii Master Plan identifies three categories of noise exposure levels for land use planning purposes. The Noise Zone 1 category are areas within noise levels of less than 65 decibel day-night equivalent sound level (Ldn), and is an area of low or no impact, although some people may be annoyed by occasional aircraft overflights. Noise Zone 2 are areas having noise exposure levels of 65-74 Ldn, and are of moderate impact where some land use controls are recommended. Areas in Noise Zone 3 (75 Ldn and above) are most severely impacted areas, and require the greatest degree of land use controls for noise exposure (NAVFAC PAC 2009).

The AICUZ study for MCB Hawaii Kaneohe Bay established existing baseline noise exposure levels based upon aviation-related operations (NAVFAC PAC 2009). The Pali Kilo project site was identified as generally being within the 65 to 69 Ldn noise contour and thus falls within Noise Zone 2. Residential use, including transient lodging, exposed to noise levels greater than or equal to 65 Ldn is “discouraged,” although deference is given to local conditions. Where the community determines that these uses must be allowed, measures to achieve an outdoor-to-indoor noise level reduction of at least 25 dB in 65 to 69 Ldn areas should be incorporated into building codes and be in individual approvals (DoDI 4165.57 incorporating change 1 dated March 15, 2015). Existing cottages are air conditioned to help mitigate aircraft noise along with other nuisances (e.g., insects).

3.4.2 Potential Impact

Action Alternatives. Under the action alternatives, long-term adverse impact on existing ambient noise levels is not anticipated. Additional noise generated from the proposed action would only occur from additional vehicles entering and exiting the project area and human voices generated from guests and guests staying at cottage units or the EU or participating in outdoor recreational activities. Most noise would likely occur during normal daylight hours, and MCCA regulations institute quiet hours at the cottages at 10:00 p.m. that would address excessive noise in the later evening hours. There are also no other noise sensitive land uses in the immediate vicinity that would be adversely impacted by the project from human voices and additional vehicles. As discussed in Chapter 3, surrounding uses are industrial in nature consisting of military training and support facilities and Runway 4-22. Other surrounding areas consist of open space and recreation use at Pyramid Rock Beach.

Guests staying at new cottages would be subject to noise from aircraft operations occurring at Runway 4-22. The project area is within Noise Zone 2 (65 to 69 Ldn) based upon the AICUZ study for MCB Hawaii (NAVFAC PAC 2009). Transient lodging within Noise Zone 2 is generally an incompatible use; however, deference is given to local conditions regarding the need for housing within this zone. Chapter 2 discusses the need for this project, and alternatives that place the cottages and EU further away from the shoreline or across (east or mauka) Palikilo Road would site these buildings closer to the runway and increased aircraft noise. Site locations closer to the runway would be less desirable largely due to distance from the shoreline and increased aircraft operations noise.

Construction of new cottages and associated infrastructure would involve different stages that utilize various types of construction equipment. The actual sound levels that will be experienced in the vicinity of the project area and at existing cottages would vary greatly during construction and are a function of the distance from the noise source, the duration of the construction activities, and the number and type of equipment used. Although existing ambient noise levels are influenced primarily by aircraft operations, construction noise would have a more localized effect on visitors staying at existing cottages situated adjacent and nearby the construction site. Equipment such as a chipping gun or jack hammer could generate noise levels of 85 dBA at a distance of 50 feet.

None of the construction noise should be loud enough to cause hearing loss for nearby guests at cottages or others in the area. However, people close to the construction site may need to raise their voice or stand closer to one another in order to communicate effectively. Although this noise disruption would likely occur over the duration of the project's construction, the impact of these disruptions are minor and of a short-term duration. Therefore, construction activities would inevitably result in short-term and minor noise impacts.

No Action Alternative. The No Action Alternative would not have short or long-term impacts on ambient noise levels because the present site conditions would continue with MCCA operation of existing cottages.

3.4.3 Mitigation Measures

Noise attenuation measures to achieve an outdoor to indoor noise level reduction of at least 25 dB within this 65 to 69 Ldn area would need to be incorporated into the design of buildings (OPNAVINST 11010.36C/MCO 11010.16). Normal permanent construction would provide an outdoor to indoor noise reduction of 20 dB; thus, additional reduction requirements would be required (NAVFAC PAC 2009). Such design measures could include air conditioning or upgraded sound transmission class ratings in windows and doors. Existing cottages are air conditioned to help reduce aircraft noise along with other nuisances (e.g., insects). Guest would also be notified of aircraft operations at check in.

Construction noise attenuation measures can be incorporated into design plans for the contractor to implement. Such measures could include erecting noise barriers around the cottage or EU construction site to reduce the noise effects on surrounding areas. Requiring contractors to use mufflers on power equipment and vehicles, and limiting activities to regular workday hours (8:00 a.m. to 4:30 p.m., Monday through Friday). Other measures could include restrictions that are typically implemented by the State DOH for other construction projects on Oahu. Such restrictions could include:

1. Not allowing any construction activities which emit noise in excess of the State DOH maximum permissible sound levels before 7:00 AM and after 6:00 PM of the same day, Monday through Friday.
2. Not allowing any construction activities which emit noise in excess of the maximum permissible sound levels before 9:00 AM and after 6:00 PM on Saturday.
3. Not allowing any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays.

3.5 Terrestrial Natural Resources

3.5.1 Affected Environment

A Marine Corps Base Hawaii Integrated Natural Resources Management Plan (INRMP) Update (MCBH 2011) addresses natural resources and identifies action components to be implemented as part of operational stewardship activities. Most of the vegetation on the base consists of secondary successional communities, dominated by introduced plants species. This is due to much of the base being used by early occupants for dryland cultivation (e.g., sweet potato), for pastureland (e.g., grasses, koa hoale), and truck farms (MCBH 2001).

A terrestrial survey of the project area along with Pyramid Rock Beach was conducted in October 2012 by a NAVFAC biologist and the Natural Resource Management Specialist for MCB Hawaii. The purpose of the survey was to identify plant species, particularly sensitive or protected species, in the area of site proposed for new cottages. All plants observed in the area of new building footprints were recorded as well as vegetation that would likely be removed during the construction process.

Table 3.1 includes a listing of recorded plant species by the region where they were found. The vegetation checklist is broken into three regions: 1) sand dunes; 2) north; and 3) south. The sand dune category includes the sand dunes of Pyramid Rock Beach. This area was surveyed because there would be an increase in beach use from the proposed EU on Pyramid Beach. The northern area generally includes the Mokapu Road end of the project site while the southern area encompasses the Palikilo Road section of the project site.

The vegetation observed was a mixture of native and introduced/invasive species. Native vegetation consists of plants that arrived to the islands naturally without the help of humans, and those found along MCB Hawaii Kaneohe Bay coastline are a prime example of Hawaii's strand ecosystem. Introduced or invasive vegetation are plants that arrived to Hawaii accidentally, or were intentionally brought by humans. In most cases, these plants can spread quickly, out-compete native vegetation, and reduce native habitat.

North: The proposed Unit 12b has *Casuarina equisetifolia* (ironwood) trees within the building footprint with native *Lycium sandwicense* (ohelo kai) ground cover mixed with *Pluchea indica*. Ohelo kai ground cover is uncommon along coastal areas of the Base due to prior site disturbances and invasive species. Vegetation at the proposed Units 12a and 11 sites consists of *hibiscus tiliaceus* (Hau) and ironwood trees. Vegetation at the proposed Unit 9 site consists of thick Hau. The proposed Unit 10 and 13a sites are vegetated by *Leucaena leucocephala* (Koa haole) and *Megathyrsus maximus* (guinea grass).

South: The proposed Pali Kilo Beach EU location along with Unit 1 and 2 sites are vegetated with koa haole and guinea grass. An existing coconut tree is nearby behind existing Unit 1606 along with a native *Thespesia populnea* (milo) tree. The area proposed Unit 3 site has tall Koa haole trees and intertwined *Hylocereus undatus* (night blooming cereus). The area further north comprised of a small hillside proposed for several units (Units 4 to 7, and 13b) contains tall weedy shrubs and grass of Koa haole and guinea grass. The proposed Unit 8 site on a sloping hill is vegetated with a mixture of invasive shrubs and grasses. There is a large mature *Terminalia catappa* (tropical almond) tree at the corner of existing cottage building 1610.

Dunes: The Pyramid Rock Beach sand dunes (to the northeast of the project area) are the best example of Hawaii's strand ecosystem. The sand dune area east of the beach parking lot has a variety of native species including large populations of *Nama sandwicensis* (Hinahina kahakai), *Chamaesyce dengerii* (Akoko) and *Heliotropium anomalum* (Hinahina).

Table 3.1 Vegetation Species List				
Sand Dunes	North	South	Scientific Name	Common Name
X	X		<i>Asystasia gangetica</i>	Chinese violet
X			<i>Bidens pilosa</i>	Spanish needle
X			<i>Boerhavia repens</i>	alena
X			<i>Canavalia sericea</i>	silk jackbean
X	X	X	<i>Casuarina equisetifolia</i>	ironwood
X			<i>Chamaesyce dengerii</i>	akoko
X			<i>Chenopodium oahuense</i>	aweoweo
X	X	X	<i>Coccoloba uvifera</i>	sea grape
X		X	<i>Cocos nucifera</i>	coconut
X			<i>Heliotropium anomalum</i>	hinahina
X	X		<i>Heliotropium curassavicum</i>	seaside weedy heliotrope
	X	X	<i>Hibiscus tiliaceus</i>	hau
	X	X	<i>Hylocereus undatus</i>	night blooming cereus
X			<i>Ipomoea pes-caprae</i>	pohuehue
X			<i>Jacquemontia sandwicensis</i>	pau o hiiaka
X		X	<i>Leucaena leucocephala</i>	koa haole
	X		<i>Lycium sandwicense</i>	ohelo kai
X			<i>Macroptilium lathyroides</i>	cow pea
X	X	X	<i>Megathyrsus maximus</i>	guinea grass
X			<i>Melanthera integrifolia</i>	nehe
		X	<i>Morinda citrifolia</i>	noni
X			<i>Nama sandwicensis</i>	nama
	X		<i>Opuntia ficus-indica</i>	prickly pear cactus
X			<i>Pandanus tectorius</i>	lauhala
X	X	X	<i>Pluchea indica</i>	Pluchea
X			<i>Portulaca oleracea</i>	pigweed
X			<i>Scaevola taccada</i>	naupaka
	X		<i>Sida fallax</i>	ilima
X			<i>Sporobolus virginicus</i>	akiaki
X			<i>Stachytarpheta cayennensis</i>	Blue rat's tail
		X	<i>Terminalia catappa</i>	tropical almond
X	X	X	<i>Thespesia populnea</i>	milo
X			<i>Tournefortia argentea</i>	tree heliotrope
X			<i>Verbesina encelioides</i>	golden crown-beard
X			<i>Vigna marina</i>	nanea
X			<i>Waltheria indica</i> var. <i>americana</i>	uhaloa
Note: Native plants highlighted in "Bold"				

The ESA-listed Hawaiian hoary bat (*Lasiurus cinereus semotus*) typically roosts in trees that provide thick vegetation. The project site lies in a coastal area that contains Ironwood trees that would provide sub optimal roosting. The Hawaiian hoary bat roosts in both exotic and native woody vegetation, and while foraging, will leave young unattended in “nursery” trees. During their breeding period (May-October), Hawaiian hoary bat occurrences increase in the lowlands. During the non-breeding period (November-April), bat occurrences increase at higher elevations (above 5,000 feet). Surveys for the detection of the Hawaiian hoary bat were not conducted, so it is not known if the species is present on the site. However, bats use a variety of habitats and it is assumed that bats are present in the project area.

3.5.2 Potential Impacts

Action Alternatives. The action alternatives should not have significant short or long-term impacts on botanical resources along the Pali Kilo project area. None of the vegetation within the area of proposed building footprints are known to be Federally or State-listed threatened or endangered, or candidate threatened or endangered botanical species. Vegetation observed was a mixture of native and introduced/invasive species. A few sites proposed for new cottages or the EU have vegetation of interest and are summarized below:

1. Pali Kilo Beach EU. An existing coconut tree is nearby behind existing Unit 1606 along with a native *Thespesia populnea* (milo) tree.
2. Cottage 8 Site. There is a large mature *Terminalia catappa* (tropical almond) tree at the corner of existing cottage building 1610 near proposed Unit 8.
3. Cottage 12b Site. Native ohelo kai (*Lycium sandwicense*) ground cover was present at this site, and is uncommon along the northern coastal areas of MCB Hawaii. Ironwood trees (*Casuarina equisetifolia*) were also present.

Proposed Action (Building 1180 Site).

Construction of the EU at the site of Building 1180 under the proposed action would improve impervious surfaces by replacing portions of the concrete-paved pad with landscaping using grass and

other native vegetation for common areas. The design phase of the EU would determine the building’s configuration, common areas, and landscaping improvements. Under the Pali Kilo Beach EU Alternative, two cottages would be built at the Building 1180 site also providing opportunities to replace portions of the concrete-paved pad with landscaping.

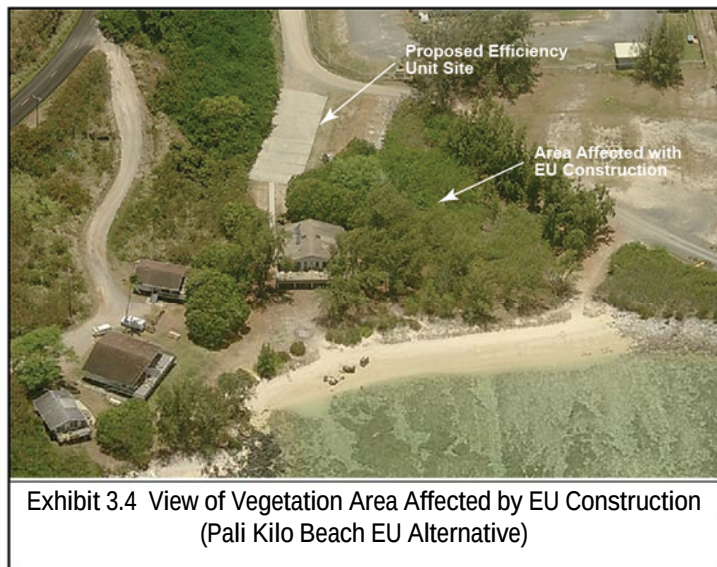


Exhibit 3.4 View of Vegetation Area Affected by EU Construction
(Pali Kilo Beach EU Alternative)

Pali Kilo Beach EU Alternative. Construction of the EU under the Pali Kilo Beach EU alternative would require removing vegetation and several trees inland of the beach area to clear this EU site (see Exhibit 3.4) resulting in a negative impact on existing vegetation. Existing non-native trees and vegetation along the shoreline would also require trimming or removal to support growth of native vegetation.

Minimization Measures

Landscape plans would be prepared as part of the design of individual cottages and the EU. Use of native coastal vegetation under landscape plans would reduce invasive species and minimize erosion in exposed areas. Trees such as Milo and tropical almond, along with other pertinent native trees, would be retained if feasible, or replaced with appropriate and approved plant material if they need to be removed. The MCB Hawaii Landscape Policy, last updated in 2010, also includes a listing of native, Polynesian-introduced and non-native plants approved for use in landscaping projects on MCB Hawaii properties along with a prohibited plant list (containing invasive and/or high maintenance species).

These landscaping elements would be consistent with the *Marine Corps Base Hawaii Integrated Natural Resources Management Plan* (INRMP) Update (MCBH 2011) that recommends incorporation of not less than 50 percent native plants into new or renovated tree, shrub, and understory landscaping. Best management practices and low impact design elements (e.g., bioretention swales or basins) would also be incorporated into the design of new cottages and the EU to minimize or achieve no-net increase in discharges of storm water runoff which support the INRMP.

Recreational activities occurring at Pyramid Rock Beach from new cottage and EU guests who venture out to the beach area away from the cottage areas are not expected to have a significant impact on native plants species present in the sand dunes of this area. The area east of the beach parking lot has a variety of native species such as *Nama sandwicensis* (Hinahina kahakai) and *Chamaesyce dengenerii* (Akoko). MCCA provides guests at registration with educational materials informing them about the environment and restrictions to make them more aware of the natural environmental setting. To further minimize effects on botanical resources from guest activities, MCCA would coordinate with other MCB Hawaii departments to update and supplement this packet with more educational materials, as appropriate.

No Action Alternative. The No Action Alternative would not have short or long-term impacts to botanical resources because the present site conditions would continue with MCCA operation of existing cottages.

3.5.3 Endangered, Threatened or Protected Species

MCBH is home to four endangered water birds, the Hawaiian Stilt (*himantopus mexicanus knudseni*), Coot (*Fulica alai*), moorhen (*Gallinula chloropus sandwicensis*), and Hawaiian duck (*Anas wyvilliana*). These waterbirds frequent wetlands around MCBH such as Nuupia ponds, the Salvage Yard wetland, Hale Koa wetlands, and Klipper Golf course ponds. The nearest wetland to the project site is the Hale Koa wetland. Stilts have been observed to use grassy lawns and rain puddles to forage outside of

wetlands in yards and parking lots. Coots, moorhens, and ducks frequent wetland areas and rarely venture far from these sites.

Waterbirds would not be impacted by the construction of the cottages and EU as the action area is not within or near wetland areas. Stilts may be sighted in grassy areas or in rain puddles, but their occurrence is rare and infrequent at this location which is typically dry and not favorable. Other endangered waterbirds are generally not attracted to this area as there are no wetlands. However, the endangered Hawaiian duck “Koloa” is known to forage in the lawn areas around the base which includes buildings in the vicinity of the cottages.

In addition to waterbirds, MCB Hawaii Kaneohe Bay hosts a variety of seabirds that are protected under the Migratory Bird Treaty Act (MBTA) or are protected by the State of Hawaii as species of greatest conservation need. Common visitors to the Base are the Great Frigatebird (*Fregata minor palmerstoni*) and Pacific Golden Plovers (*Pluvialis fulva*). The Laysan Albatross (*Diomedea immutabilis*) is an infrequent visitor to the Base. The Wedgetailed Shearwaters (*Puffinus pacificus*) and Red-footed booby (*Sula sula rubripes*) are residents of the Base with each having a colony of many hundred birds that nest on the southeast shoreline. Pacific Golden Plovers migrate to Hawaii for the winter and use a wide range of habitats around the Base, but favor grassy areas to forage. They return to western Alaska for the summer to breed and raise their young. From November to December young fledglings are often disorientated by light pollution such as field lights and other outdoor lighting. Young circle these lights and become grounded out of exhaustion where they are subject to predators. Wedgetailed Shearwaters seabirds also transit the base from foraging grounds within Kaneohe Bay or the open ocean.

MBTA birds, such as the Pacific Golden Plover, may be seen in this area to forage in grassy plots and along the shoreline. There would be no impact by the construction as these birds are seasonal and their primary foraging and nesting areas are in western Alaska. All outdoor lighting should be fully shielded and downward facing to mitigate impacts to Wedgetailed Shearwaters. Outdoor lighting codes and information on stranded shearwaters can be found in the MCBH INRMP. The use of bollard lighting instead of pole lighting would also be considered to provide visibility along walkways and parking areas, and direct lights away from the ocean.

While the project site contains habitat that could potentially support the Hawaiian hoary bat, habitat destruction during the construction phase could impact the bat; however, the following measures can be taken to minimize impacts:

1. No trees taller than 15 feet should be trimmed or removed during the Hawaiian hoary bat’s pupping season, which occurs between June 1 and September 30, because non-volant juvenile bats (bats that cannot fly) may be roosting in the trees.
2. If any pups are discovered in the construction zone, outside the normal nesting season (June 1 through September 30), vegetation clearing will stop and move 100 yards away. Construction will not resume until the bat pups have fledged and departed the area.

3.6 Visual Resources

3.6.1 Affected Environment

The City's *Koolaupoko Sustainable Communities Plan* (DPP 2000), adopted under Ordinance 00-47, presents guidelines, policies, and conceptual schemes that serve as a City policy guide for more detailed zoning, maps, and regulations. Panoramic views of natural features and landmarks identified under this plan depict the vantage points and orientation of major panoramic views of resources within Koolaupoko. Under this plan's Open Space Map, no significant views from stationary points, or continuous or intermittent views of scenic importance from major public roadways were identified within the Base or of natural features within the Base. Continuous or intermittent views from public roadways were generally of Kaneohe Bay and Kailua Bay.

Mokapu Peninsula is a visual resource for public views from multiple Windward communities, hiking trails in the Koolau Mountains, and off-shore in Kaneohe Bay, Kailua Bay, and the Pacific Ocean. Views include the large topographic features of Ulupau Crater, Puu Hawaii Loa peak, the large industrial buildings clustered around the airfield, the coastline, and the wetland and wildlife areas of Nuupia Ponds. The project area is located on the northwest shoreline of the Mokapu Peninsula and is essentially not visible from Windward Oahu vantage points and the rest of the Base. The affected view shed is localized to views from Palikilo and Mokapu Roads and truncated views along the shoreline.

Notable visual resources in this area include views of Kaneohe Bay from several vantage points along Palikilo Road, views of the undulating and in some instances, steeply sloped and undeveloped terrain of the project site, Pyramid Rock and dramatic sweeping views of Pyramid Rock Beach. Views from the project site are dramatic which include sweeping views of Kaneohe Bay and the distinctive ramparts of the Koolau range. Views of the developed areas of base including the airfield are masked by the ridgeline between the project area and the rest of the Base, adding to the sense of seclusion. Figure 3.4 includes some photos providing examples of the various views available from the project area.

3.6.2 Potential Impacts

Action Alternatives. The action alternatives would alter the present visual character of the Pali Kilo coastal area due to the addition of new cottages and the EU. However, these changes should not have a significant long-term adverse impact on visual resources or the character of this area or impede established public view planes. This coastal area is presently used for recreational cottages and has been designated for such use under the MCB Hawaii's master plan. Therefore, the overall character for the area given its designated land would not change although there would be a greater concentration of cottages and the EU present. Being located within the public restricted areas of the Base, scenic views of the coastline and area would not be affected because none are presently available to the general public.



Northern Ocean View from Top of Hill



Western View of Ocean



Southwest View of Ocean and Koolau Mountains



Southeast View of Inland Area of Base



Northeast View of Pyramid Rock and Beach



Southwest View of Hill Along Coastline

Viewsheds

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Figure 3.4

Notable visual resources and views within this area of the Base consist of ocean views of Pyramid Rock and Pyramid Rock Beach from Mokapu Road that would be retained under the action alternatives. The design of new cottages would be single-story structures similar to existing cottages that would reduce visual incompatibility among cottages along this coastal area. Landscaping would also be incorporated into the design for each cottage constructed to mitigate views of these structures from Palikilo Road and Mokapu Road.

Proposed Action (Building 1180 Site). Views of the EU under the proposed action would be more visible from Base roadways in the immediate vicinity because it is situated at the intersection of Palikilo Road with Mokapu Road. However, the character of this view would change from industrial (Building 1180, fencing, and parking) to residential with the EU development. Exhibit 3.5 shows a photo of the current character of the Building 1180 site. Landscaping incorporated with the design of this EU can reduce and soften views of this EU complex at this intersection. This view would thus be more compatible with the character of the coastline and other cottages in the area. The proposed action would result in a greater change in views of the southern end of a small knoll along Palikilo Road because of the addition of two duplex cottages (Cottages No. 1 and 2) next to Building 1606.



Pali Kilo Beach EU Alternative. Views of the existing area at Pali Kilo Beach would be changed due to construction of the EU in that area under the Pali Kilo Beach EU Alternative. The EU would require removing vegetation and trees along with trimming trees that would alter this area from the parking area to the shoreline (refer to Exhibit 3.4). The visual impact from the EU would be minimized by this alternative because the EU would be behind a knoll and not seen from Mokapu Road and would not obstruct views of the shoreline.

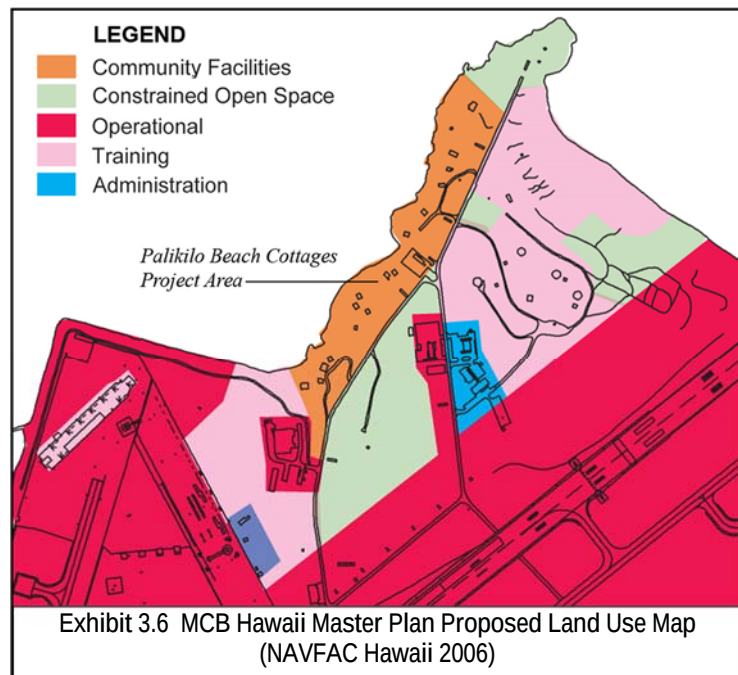
No Action Alternative. The No Action Alternative would not have short or long-term impacts on visual resources or important viewsheds because the present site conditions would continue with MCCA operation of existing cottages.

3.7 Land Use Compatibility

3.7.1 Affected Environment

The MCB Hawaii Master Plan (2006) identified existing land uses by categories for the Base, and the Pali Kilo project area was designated as “Community Facilities.” Under the proposed land use map, the project area remains designated as “Community Facilities” (see Exhibit 3.6). This coastal area is presently used by MCB for the operation of rental cottages, which is consistent with the designated land use for the area.

The area to the north that includes Pyramid Rock is designated as “Constrained Open Space” along with other areas west (inland) of Palikilo Road and Mokapu Road. Pyramid Rock Beach and adjacent areas, along with the Pali Kilo Beach area, is designated as “Training” land use. The Master Plan also identified future projects for MCB, and the construction of additional cottages (Project MC-9) via infill (NAVFAC Hawaii 2006).



3.7.2 Potential Impacts

Action Alternatives. The action alternatives would not have a significant impact on land use within the project area because the new cottages and EU are consistent with existing use and MCB operations in the area. Action alternatives would also be consistent with the MCB Hawaii Master Plan that designated the project area as “Community Facilities,” and identified the construction of additional cottages via infill.

No Action Alternative. The No Action Alternative would have no impact to the present land use of the area because the present site conditions would continue with MCB operation of existing cottages. However, this alternative would not be consistent with the MCB Hawaii Master Plan that identified the construction of additional cottages (Project MC-9) via infill for this area (NAVFAC Hawaii, 2006).

3.8 Infrastructure Facilities

3.8.1 Affected Environment

Water Supply System

MCB Hawaii Kaneohe Bay obtains its potable water supply from the City and County of Honolulu (City) Board of Water Supply (BWS). The BWS provides potable water to the Base up to 5,200 gallons per minute (gpm) at a minimum pressure of 60 pounds per square inch (psi). A 20-inch transmission main routed along the back gate of Mokapu Road services the Base. Water for emergency fire flow and general back-up purposes is stored in five reservoirs on the Base. Water distribution lines are routed along Palikilo Road and Mokapu Road serving the project area with connections running along access roads to service existing cottage units (NAVFAC Hawaii 2006). Fire hydrants are located along roadways near both the Building 1180 site and near Pali Kilo Beach to provide fire protection for those facilities. A few fire hydrants are also present along Palikilo Road to provide fire protection for cottages in the area.

MCB Hawaii Kaneohe Bay is located within BWS's Koolau-poko district, and the sustainable yields for potable ground water (in 2008) was estimated to be about 40 million gallons per day (mgd). The BWS has water use permits for ground water withdrawal of 16.3 mgd, and about 10.1 mgd was drawn in 2009 below their permitted totals. From 1994 to 2009, the amount of ground water production was fairly consistent, and has been trending slightly downward from 14.7 mgd in 1994. MCB Hawaii Kaneohe Bay received 1.9 mgd from the BWS system in 2009, and operated a water reclamation facility (WRF) that produced 1.5 mgd of R-2 recycled water. Projected water demand by the year 2030 was projected to decrease by about 1.7 mgd due to a projected decline in regional population (Townscape, Inc. 2012). Using the BWS domestic consumption guidelines of 500 gallons/unit (BWS 2002), the 14 existing units are estimated to generate an average daily demand of 7,000 gallons.

Wastewater System

MCB Hawaii Kaneohe Bay maintains and operates a wastewater collection system for most areas of the installation. Areas that are not served by this collection system use cesspools, or septic tanks with seepage pits. The Base's water reclamation facility (WRF) is located west of the main gate along the shoreline of Kaneohe Bay. The WRF design capacity is 2.0 million gallons per day (mgd), and wastewater flows to the plant averaged 1.45 mgd in 2006 (NAVFAC Hawaii 2006). More recent WRF flows from March to June 2007 averaged about 1.17 mgd (HDR/Hawaii Pacific Engineers 2008).

About 0.5 mgd of effluent from the Base's WRF is used for irrigation of the Base golf course. The remaining effluent is pumped via a force main to the City's Kailua Regional Wastewater Treatment Plant for deep ocean disposal through the City's Mokapu ocean outfall (NAVFAC Hawaii 2006). A six-inch sewer line collects wastewater from the existing cottages where it is conveyed to the WRF via a sewer pump station located at the Building 1180 site.

Using the City's design flow factors from their wastewater design standards (80 gallons per day per capita; DWM 1993), the existing cottages are estimated to generate about 3,200 gallons of wastewater per day. This estimate is based upon 14 existing units (cottages) and an average occupancy of 2.8 persons per unit.

Storm Drainage System

Storm water runoff on MCB Hawaii Kaneohe Bay is carried by an extensive system of box culverts, lines, and ditches. Within the Pali Kilo project area, there are no box culverts or other improved drainage facilities serving existing cottages. Existing storm water runoff sheet flows toward lower lying areas eventually discharging into Kaneohe Bay.

Solid Waste Disposal

MCB Hawaii Kaneohe Bay provides solid waste collection and disposal for administrative, industrial, military, commercial and bachelor quarters areas of the Base. Solid waste is disposed of in the MCB Hawaii Kaneohe Bay's sanitary landfill, located on the south slope of Ulupau Crater. About 3,000 tons per year of waste is placed in the landfill. Given the present rate of waste generation, the landfill site should accommodate the Base's requirements for another 30 to 40 years. A commercial contract service collects solid waste from family housing areas for disposal at off-Base facilities. Solid waste generated by the existing cottages is collected and disposed of at the MCB Hawaii Kaneohe Bay's sanitary landfill. Recycling trash cans are also provided in each cottage that are taken to the Base's recycling center when full.

Electrical and Communications Distribution System

Electrical power is supplied to MCB Hawaii Kaneohe Bay by Hawaiian Electric (HE), one of Hawaii's regulated public utility power generators. HE's primary electrical service is distributed to the HE Mokapu Substation located near the H-3/Main Gate via a 46 kilovolt (kV) transmission line. The substation steps down the incoming voltage to 11.5 kV, which is then fed to the Base's Main Substation and then distributed to three other substations within the Base. Electrical power is distributed throughout the Base via both overhead and underground lines. Within the Pali Kilo project area, electrical power to existing cottages is distributed via overhead lines.

Joint Hawaii Information Transfer System, which is run by the prime contractor AT&T, provides telecommunication service for the Base. Services include data and telephone services that are also distributed in the project area via overhead lines.

Roadway Facilities

MCB Hawaii Kaneohe Bay's peninsula is served by a network of roadways with the primary vehicular access allowed to the Base via Mokapu Road and G Street, which serves as the main access point. Mokapu Road is a two-lane, two-way roadway providing the only vehicular access to the project area. It crosses Runway 4-22 at a designated checkpoint before terminating at Pyramid Rock Beach. Palikilo

Road is a two-lane, two-way roadway providing access to the project site between Mokapu Road and Sumner Road. Palikilo Road intersects with Mokapu Road adjacent to the Building 1180 site.

Vehicle traffic along project area roadways is generally light during the weekday morning and afternoon commuter periods. Since the project is situated at the northwestern corner of the Base, the only major traffic generators in the area are Pyramid Rock Beach, the MCCA cottages, and a few buildings predominantly used for administrative uses. Traffic is heavier during weekends and holidays due to recreational activities occurring at Pyramid Rock Beach. Vehicular traffic crossing the runway is heavier during the mid-day period because most aircraft take-off and landing operations occur during this timeframe. This timeframe also occurs during the typical lunch period for Base employees. Therefore, moderately long waits and lines for vehicles sometimes occur at the runway checkpoints due to conflicts with aircraft operations.

The 14 existing cottage units are projected to generate 104 vehicular trips a day (52 entering, 52 exiting), and 10 and 13 trips during the morning and afternoon weekday commuter peak hours, respectively. This was estimated using the Institute of Traffic Engineers (ITE) trip generation rate for Motels; Occupied Rooms (ITE 2003), and using a 90 percent occupancy factor.

3.8.2 Potential Impacts

Water Supply System

Action Alternatives. The action alternatives would generate additional demand for potable water supply from the City BWS. Using the BWS domestic consumption guidelines, these alternatives would generate an average daily demand of 20,000 gallons (500 gallons/unit) (BWS 2002). This reflects an increase of 13,000 gallons over existing conditions where existing cottages are estimated to generate 7,000 gallons a day. The total demand generated by action alternatives and existing units would be 27,000 gallons (0.027 mgd) in this area which is a minor addition relative to the total daily demand generated by this base. This estimate is probably quite higher than actual use because the estimated wastewater generated using the City's design flow factors is only 14,200 gallons per day. Nevertheless, using the BWS guideline provides a more conservative (higher) estimate for planning purposes.

The additional 20,000 gallons is not expected to significantly impact the total amount of water the Base receives from BWS (1.877 mgd in 2009). Extensions to existing water distribution lines along Palikilo Road and Mokapu Road would be constructed by MCB Hawaii Kaneohe Bay to serve additional units. Sustainable and green building practices would also be incorporated to minimize water use such as low flow plumbing fixtures.

An existing fire hydrant at the Building 1180 site should be sufficient to provide fire protection for the EU planned there under the proposed action. A fire hydrant at an existing operations facility would provide fire protection for the EU proposed under the Pali Kilo Beach EU Alternative. Other existing fire hydrants along Palikilo Road would provide fire protection for additional cottages.

No Action Alternative. The No Action Alternative would not have an impact on the existing water supply system because the present site conditions would continue with MCCA operation of existing cottages which is an estimated daily use of 7,000 gallons.

Wastewater System

Action Alternatives. The action alternatives would generate additional wastewater that would be collected and disposed of at the WRF. Using the City's design flow factors from their wastewater design standards, these alternatives would generate additional average daily flows of about 11,000 gallons over current conditions. This estimate is based upon 49 units, an average occupancy of 2.8 persons per unit, and 80 gallons per day per capita (DWM 1993). Given existing flows of about 3,200 gallons, the total flows generated from this area would be about 14,200 gallons.

This additional wastewater is not expected to significantly impact the WRF design capacity (2.0 mgd) which should have sufficient capacity (operating at about 73% capacity in 2006). The additional flows would amount to less than 0.8 percent of the 2006 flows. Extensions connecting new cottages and the EU to the existing wastewater collection system serving this area would be constructed by MCB Hawaii Kaneohe Bay. The design of individual cottages and EU would include coordination with MCB Hawaii Kaneohe Bay departments to review and approve construction plans.

No Action Alternative. The No Action Alternative would not have an impact on the existing wastewater system because the present site conditions would continue with MCCA operation of existing cottages.

Storm Drainage System

Action Alternatives. The action alternatives would generate additional storm water runoff due to the construction of new cottages and EU that would increase the amount of impervious area over present conditions. However, sustainability elements will be incorporated into the design of individual cottages and the EU to try to achieve no net increase in storm water discharged from the site. Low impact design (LID) elements will be considered during the design phase and may include measures such as bioretention swales or basins (e.g., rain garden) for storm water detention. Site improvements would also consider including the design and use of materials associated with permeable pavements for pedestrian paths, porous asphalt pavement for driveways and parking areas, and other materials to reduce runoff as part of best management practices.

With sustainability design measures, the project should be able to achieve or get close to no net increase in storm water runoff. Any increase in runoff would be low and should not have a significant impact on the surrounding area. Cottages would also be spread out over the project area reducing the concentration of flows in any particular area. MCB Hawaii Kaneohe Bay is also dryer than other areas of the Windward district (54 inches per year) being located away from the mountain range further reducing the potential for effects from storm water runoff. Storm water runoff would continue to sheet flow into lower lying areas eventually discharging into Kaneohe Bay.

Best management practices would be incorporated into design plans to minimize effects from storm water runoff during short-term construction activities. Other measures would be incorporated into the design of buildings to address long-term effects on potential erosion and to reduce storm water runoff following applicable management plans, design standards, and NPDES permit requirements.

No Action Alternative. The No Action Alternative would not have an impact on the existing storm water runoff occurring in the area because the present site conditions would continue with MCCS operation of existing cottages.

Solid Waste Disposal

Action Alternatives. The action alternatives would generate additional solid waste associated with short-term construction activities and the long-term operation of new units. Additional waste is not expected to have a significant impact, and would continue to be collected and disposed of at MCB Hawaii Kaneohe Bay's sanitary landfill that had been projected to accommodate the Base's requirements for another 30 to 40 years.

Construction waste generated by new units built would be a short-term impact creating solid waste that is typical of construction-related activities. This typically consists primarily of vegetation, rocks, concrete, and other debris created from clearing, trenches, and other related building construction activities. The composition of additional waste generated by additional units under the action alternatives should be similar to residential waste now occurring with existing cottage units. The majority of waste should consist of organics (food), paper, and plastics that can be taken to the Base's sanitary landfill for disposal. Recycle bins would also be provided at new cottages for recyclable material that can be collected and delivered to the MCB Hawaii Kaneohe Bay's recycling center.

No Action Alternative. The No Action Alternative would not have an impact on the Base's sanitary landfill because the present site conditions would continue with MCCS operation of existing cottages.

Electrical and Communication Systems

Action Alternatives. The action alternatives would generate additional demand for electrical service from HE due to operation of additional units at Pali Kilo. The additional electrical demand is not expected to have a significant impact on HE's Mokapu Substation or distribution system within MCB Hawaii Kaneohe Bay. The expansion of existing overhead lines providing electrical power to cottage units along the Pali Kilo project area would occur, and the design of new cottage units and the EU would be implemented by MCB Hawaii Kaneohe Bay in coordination with HE. Overhead communication lines to the new units would similarly be provided using the current contractor managing data and communication services within the Base.

No Action Alternative. The No Action Alternative would not have an impact on electrical power supplied to the Base because the present site conditions would continue with MCCS operation of existing cottages.

Roadway Facilities

Action Alternatives. The action alternatives would generate additional vehicle trips to and from the Pali Kilo project area due to construction and operation of additional cottage units and the EU complex. However, the additional vehicular traffic generated should not have a significant impact on Palikilo Road or Mokapu Road. Construction-related traffic would result in a short-term increase in vehicular traffic.

The proposed 49 additional lodging units would generate 392 new vehicular trips on a daily (24-hour) basis (196 entering, 196 exiting) based upon the Institute of Traffic Engineers (ITE) trip generation rate for Motels; Occupied Rooms (ITE 2003), and using a 90 percent occupancy factor (44 units occupied). During the weekday commuter peak hours, 44 trips (16 enter, 28 exit) would be generated during morning peak hour and 29 trips (15 enter, 14 exit) during the afternoon peak hour. Table 3.2 shows an estimate of future traffic generated by the project.

Table 3.2 Trip Generation for Project					
ACTION ALTERNATIVES	Motel (320) Trip Rate	Dwelling Units	Trips Entering	Trips Exiting	Total Trips
Weekday Total (Average Daily) Cottages / Efficiency Unit Complex (90% Occupancy of 49 Units)	8.91	44	196	196	392
Weekday Peak Hour (One Hour Between 7 and 9 a.m.) Cottages / Efficiency Unit Complex (90% Occupancy of 49 Units)	1.00	44	16	28	44
Weekday Peak Hour (One Hour Between 4 and 6 p.m.) Cottages / Efficiency Unit Complex (90% Occupancy of 49 Units)	0.66	44	15	14	29
Note: ITE fitted curve equations used to calculate trips. Source: Institute of Transportation Engineers (2003) <i>Trip Generation</i> , 7 th Edition					

Existing cottages are estimated to generate 14 trips (5 entering, 9 exiting) during the morning peak hour and 13 trips (7 entering, 6 exiting) during the afternoon peak hour. Therefore, the total cumulative trips generated with the project during the morning peak hour would be 58 vehicles (21 entering, 37 exiting) and 42 vehicles (22 entering, 20 exiting) during the afternoon peak hour. The minor increase in traffic (average less than one car added to immediate roadways every minute) during the peak commuter hours due to guests renting the additional units would have a minor impact on Palikilo Road and Mokapu Road.

Traffic from MCCA operations (housekeeping activities) would add a few more vehicles to this project area, however, such vehicular traffic would typically occur outside of the commuter morning and afternoon peak hours. Vehicular traffic along these roads during weekday morning and afternoon peak hours is generally light being located within a restricted Base, and having few major traffic generators in the area. As previously discussed, traffic generators in the area primarily consist of Pyramid Rock Beach,

the MCCA cottages, and a few buildings predominantly used for administrative uses. The unsignalized intersection of Palikilo with Mokapu Road should continue to operate with little traffic delays during the commuter morning and afternoon peak hours.

Proposed actions would also contribute to additional traffic crossing the runway and contributing delays at runway checkpoints during flight operations. However, most traffic from cottage guests should not occur during the heavier mid-day period at the runway crossing. Most guests leave in the morning for activities and return in the afternoon occurring outside this timeframe. To help alleviate increased congestion at runway checkpoint crossings, MCCA could inform guests of this condition so they can appropriately schedule their travel periods.

No Action Alternative. The No Action Alternative would not have an impact on existing MCB Hawaii Kaneohe Bay roadways in the project area because the present site conditions would continue with MCCA operation of existing cottages.

3.8.3 Clean Water Act of 1972

Section 401. The action alternatives would not require a State of Hawaii Water Quality Certification (WQC) under this section of the Clean Water Act (CWA) because there would be no activities, construction or operation of the MCCA units that may result in direct discharges to waters of the United States. The No Action Alternative would not trigger the need for a State WQC under Section 401 of the CWA because there would be no change to existing operations.

Section 402. The action alternatives would require compliance with MCB Hawaii's NPDES permit (HI 1121423) conditions and storm water pollution prevention plan. This includes incorporating necessary best management practices in design plans for construction activities related to the new cottages and the EU. The contractor would comply with permit conditions and implement required best management practices. The No Action Alternative would not trigger actions under the NPDES permit issued to MCB Hawaii Kaneohe Bay because there would be no change to existing operations.

Section 404. The action alternatives would also not require a U.S. Department of Army permit under this section of the CWA because there would not be a discharge of dredged or fill material into a wetland or other navigable water of the U.S. The No Action Alternative would not trigger a Section 404 permit because there would be no change to existing operations.

3.9 Recreational Facilities

3.9.1 Affected Environment

MCCA provides both indoor and outdoor recreational facilities such as ball fields, gymnasium, etc. Outdoor natural resources (beaches) are also available throughout the Base that support other recreational activities such as fishing and water sports. In the vicinity of the project area on the western side of the runway, the main recreational opportunities consist of beach and ocean-related activities at Pyramid Rock Beach and Hale Koa Beach.

MCB Hawaii has regulations prohibiting certain recreational activities and regulating others under Base Order P1710.1 (July 2012). These regulations identify and address: 1) prohibited activities (e.g., hunting and hang gliding); 2) restricted and designated areas for rollerblading, skateboarding, and bicycling; and 3) water sports activities. Use of MCB Hawaii Kaneohe Bay's beaches, shorelines, and waters are regulated, and only authorized persons (e.g., military personnel and Department of Defense civilian employees) are granted access. At the Pali Kilo project site, only guests to the cottages are allowed access to the beach, shoreline, and off-shore waters in front of the existing cottages extending seaward for 50 yards. Exhibit 3.7 shows this restricted area along the Pali Kilo coastline reserved only for cottage guests based upon Base Order P1710.1.

Pyramid Rock Beach (Exhibit 3.8) is a large sandy beach that extends from Pyramid Rock eastward to the northern end of Runway 4-22. As previously shown on Exhibit 3.7, the beach is authorized for recreational use. Amenities at Pyramid Rock Beach include an unpaved parking area, covered picnic shelter, portable restrooms, and a dedicated lifeguard stand and staff. Hale Koa Beach, located further south of the project area, is a smaller sandy beach also authorized for recreational use (refer to Exhibit 3.7). Facilities at Hale Koa Beach include an unpaved parking area, covered picnic shelter, and restroom facilities. No lifeguards are assigned to this beach.

The Pali Kilo project area has a predominantly rocky shoreline with isolated patches of sand areas as shown on Exhibit 3.9. The northern section of this coastline has a small pocket beach in front of existing cottages 1601 and 1602, and another pocket beach is available during low tide near the existing Building 1180 site. The southern shoreline of the

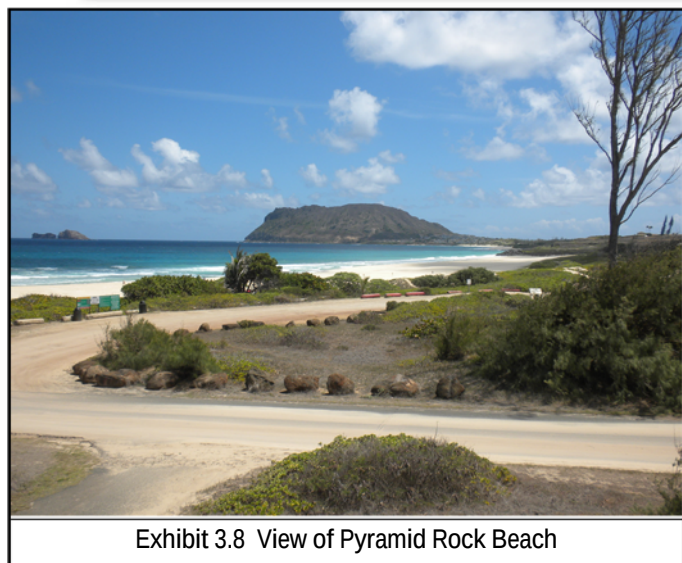
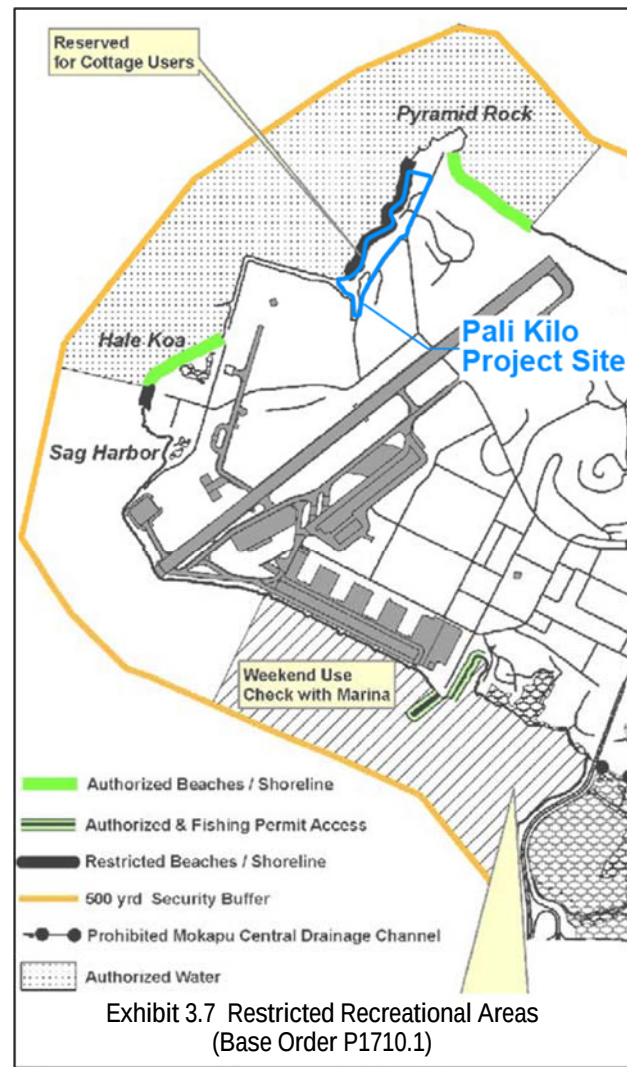


Exhibit 3.8 View of Pyramid Rock Beach



Exhibit 3.9 Oblique Aerial View of Pali Kilo Coastline

project area consists of a cove at Pali Kilo Beach with a small sandy beach and no improved facilities. As discussed above, the coastline along the project area, including Pali Kilo Beach, is a restricted area where access and use is only available to guests of existing cottages.

Pali Kilo Beach is popular for beach recreational activities, particularly from guests staying in units 6171, 1603, 1605, and 1606. Shoreline conditions at this beach are more accommodating for children, as compared to the rocky shoreline along the project area or at Pyramid Rock Beach. Pyramid Rock Beach occasionally experiences high surf conditions, high trade wind exposure, and underlying currents. MCCS characterizes the number of people using Pali Kilo Beach as being very light with typically less than four people using the beach at a given time. In general, swimming and snorkeling are not typical activities in the project area due to Pali Kilo's rocky coastline. Not many cottage guests walk along this shoreline, most likely due to the rocky conditions. Guests who do walk along the shoreline usually follow roadways or unpaved driveways in the morning or evening as part of normal exercise routines.

3.9.2 Potential Impacts

Action Alternatives. The action alternatives would generate additional cottage guests to the area that could use existing recreational facilities in the area. It is estimated that about 125 additional guests (assuming 90% occupancy for new units) could be added to the area based upon information from Section 3.10. When added to the existing estimated population using the cottages (about 36 guests) now, the total guest population in the project area would be 161 guests. Guests most likely take advantage of other MCB Hawaii Kaneohe Bay indoor and outdoor recreational facilities during their stay, including accessible beaches for sun bathing, relaxing, jogging or walking, or various water sports (e.g., surfing, snorkeling). Pyramid Rock Beach would likely continue to be the most popular destination for beach-related activities and, to a lesser extent, the guests-only restricted sites along the Pali Kilo coastline (Pali Kilo Beach and pocket beaches along the rocky coastline). The increased use of Base

recreational facilities by cottage guests is not expected to have a significant impact on these facilities that should be able to accommodate a minor increase in use.

The purpose of the cottages and EU complex is to take care of Marine Corps personnel and their families along with the broader DOD community support. Use of recreational facilities provides individuals the opportunity to relax, benefit from time with family, and enjoy a positive and rewarding experience. Given that the Base has restricted public access, use of recreational facilities and resources would continue to be limited to DOD personnel and other authorized persons as opposed to recreational areas outside of the facility that are open to the general public.

Pyramid Rock Beach has open sandy areas of over 10 acres which is large enough to accommodate outdoor recreational activities by additional cottage guests and their guests, particularly during weekdays. Hale Koa Beach could also be used by cottage guests, although guests would be expected to predominantly frequent Pyramid Rock Beach. As discussed above, swimming and snorkeling do not typically occur along the project area shoreline due to Pali Kilo's rocky coastline. The coastline site conditions would remain the same under the proposed action; therefore, a significant increase in swimming and snorkeling is not anticipated with the implementation of either action alternative.

Guests of the proposed EU complex location at Building 1180 would likely utilize the larger Pyramid Rock Beach due to its proximity. Similarly, the Pali Kilo Beach EU Alternative would naturally elicit increased use of Pali Kilo Beach due to its proximity as well. The 14-unit EU would generate approximately 36 guests against a baseline observation of 4 persons on the beach at any one time. MCCS would need to expand its management controls in this area to ensure guest safety and minimize potential impacts to the strand vegetation and nearshore resources. Due to increased use, MCCS might also need to consider providing additional amenities such as a dedicated lifeguard stand and staff, or increased signage.

To minimize impacts on MCB Hawaii Kaneohe Bay recreational facilities, such as nearby beaches and the Pali Kilo coastline area, MCCS would continue providing guests with informational materials to educate them about the sensitivity associated with resources, the surrounding area, and pertinent regulations. MCCS would continue working with other MCB Hawaii Kaneohe Bay departments to address concerns with the management of guest activities and operations along this coastline. Coordination of such activities would include addressing various areas such as landscape maintenance (e.g., tree trimming) and the quality of tree maintenance work conducted, updating educational materials for cottage guests, informing guests of authorized vehicular parking in the area, eliminating littering, not allowing camp fires, and enforcement of regulations.

No Action Alternative. The No Action Alternative would not have an impact on existing recreational facilities in the project area because present site conditions would continue with MCCS operation of existing cottages.

3.10 Socio-Economic Environment

3.10.1 Affected Environment

According to the 2010 U.S. Census, the population of the State of Hawaii in 2010 was 1,360,301 persons and the population of the City and County of Honolulu was 953,207 persons. The Koolauapoko Census County Division (CCD), which generally encompasses the area on the Windward side of the island from Waimanalo to Waikane, had a population of 114,010 persons in 2010. The population in 2010 within MCB Hawaii Kaneohe Bay was 9,517 persons (Census Tracts 108.01 and 108.02). There were 36,715 households in the Koolauapoko CCD in 2010, and MCB Hawaii Kaneohe Bay had 2,208 households (DBED&T 2015). Average household size for the district was 3.11 persons compared to 4.31 persons for MCB Hawaii Kaneohe Bay, likely due to a higher number of families residing within the Base.

MCCS estimates average occupancy rates for the cottages at 2.8 guests per unit, reflecting a higher number of couples renting the cottages. That translates to a de facto population of about 36 persons within the 16.8-ac project area (assuming 90% occupancy and 2.8 guests per unit) or about 2.14 persons per acre. For comparison, the MCB Hawaii Kaneohe Bay installation averages about 5.44 persons per acre, the Koolauapoko District averages about 2.75 persons per acre and the Island of Oahu averages about 2.49 persons per acre.

The City's *Koolauapoko Sustainable Communities Plan* (DPP 2000) includes the area of the Koolauapoko CCD along with additional areas further north of Waikane. This Plan projects the district to experience minimal population growth in the future. The City projected this district's population to increase from about 117,700 persons in 1995 to approximately 122,100 persons by 2020, or by less than one half of one percent per year.

3.10.2 Potential Impacts

Action Alternatives. The action alternatives is estimated to generate a few (less than five) new permanent full-time jobs primarily associated with housekeeping and maintenance for the new EU complex. These new jobs would create a relatively small, but positive, impact to MCB Hawaii Kaneohe Bay employment and the Island of Oahu. Additional personal income would be generated for operational employees from wages paid, and these jobs are expected to be filled by residents from within the Base or the Island of Oahu. Fiscal impacts would primarily involve small but additional tax revenue generated to the State from personal income and general excise taxes from expenditures.

Short-term economic and fiscal effects from alternatives would be associated with temporary construction jobs generated by these alternatives that would have a small but minor positive economic impact. Direct construction jobs created would also stimulate indirect and induced employment and spending of wages within other industries on the island such as retail, restaurants, material distributors, and other related businesses supporting the construction industry. These construction jobs would be filled by residents from the Island of Oahu employed within the construction industry. Construction-related tax revenues generated would also have a minor positive effect on the State's fiscal condition.

The proposed action would considerably increase the de facto population within the Pali Kilo coastal area. As noted, the existing cottages generate a de facto guest population of about 36 guests on any given day, resulting in a population density of about 2.14 guests per acre (based upon 16.8-acre project area). The proposed action would increase the de facto population to about 161 guests or about 9.6 guests per acre. The Pali Kilo Beach EU alternative would yield slightly fewer (11) guests and a proportionate reduction in density per acre as compared to the Building 1180 EU Option.

In comparison, recreational lodging at Bellows Air Force Station in Waimanalo has 109 beach-side cabins, 8 air-conditioned apartment units, and 10 cedar camper cabins (127 total vacation units) spread across an area of about 65 acres. Using a similar MCCA occupancy estimate of 2.8 guests per unit ratio for comparative purposes, this area would have about 360 persons or about 5.5 persons per acre. This also doesn't include the 55 family campsites available at Bellows that would considerably increase the area's density (to about 510 persons and 7.9 persons per acre).

This increase in persons staying at cottages in the Pali Kilo project area should not have a significant negative impact on the social environment or existing character of the area. Guests renting the cottages would consist of active duty personnel (90%), retirees, or other DOD personnel who already reside on island or potentially, on Base. Thus, the action alternatives would not increase the resident population on Oahu. MCB Hawaii Kaneohe Bay had a resident population of 9,517 persons in 2010, and the increase of 140 persons to this total (1.47%) should have a relatively minor effect on population within the Base.

The Pali Kilo coastal area has been designated for cottage use under the MCB Hawaii Master Plan, and the action alternatives would be consistent with this master plan that calls for increased cottages in this area via infill. The Pali Kilo project area is rural in character, and this rural character would generally be retained with the additional cottages and the EU. The anticipated change is increased transient density within the Pali Kilo project area. However, the increased density should not have a significant impact on the project area's character. Although more persons would be staying along the coastline, the density of the area would be comparable to other military recreational lodgings areas such as at Bellows Air Force Station. The action alternatives would not change other surrounding land uses that are industrial in character (training facilities, administrative buildings, etc.).

To address potential concerns with modest density increases within the project area, MCCA can phase implementation of units over time and evaluate the changes occurring. MCCA can also monitor the occupancy rate and demand for cottages along with experiences of their guests to guide future decisions on phased implementation as this input would influence projected market demand for these recreational cottages.

No Action Alternative. The No Action Alternative would not have an impact on the social or economic environment in the project area because present site conditions would continue with MCCA operation of existing cottages.

3.11 Surface Waters and Water Quality

3.11.1 Affected Environment

There are no streams present in the Pali Kilo project area or in the surrounding vicinity. Storm water runoff in the area sheet flows into lower lying areas following natural drainage patterns eventually discharging into Kaneohe Bay.

The waters of Kailua Bay and outer portions of Kaneohe Bay, which includes the project area, are designated by the State of Hawaii as Class A marine waters. The management objective of Class A waters is to protect the waters for recreational and aesthetic enjoyment. Surface waters surrounding Mokapu Peninsula are classified and regulated by the State of Hawaii under Title 11, DOH, Chapter 54 Water Quality Standards, Hawaii Administrative Rules.

3.11.2 Potential Impacts

Action Alternatives. Additional cottages and the EU constructed under the action alternatives would increase the present amount of impervious surfaces within the project area which would subsequently generate increased storm water runoff from the area. However, sustainability elements will be incorporated into the design of individual cottages and the EU to try to achieve no net increase in storm water discharged from the site. Low impact design elements will be considered during the design phase and may include measures such as bioretention swales or basins (e.g., rain garden) for storm water detention. Site improvements would also consider including the design and use of materials associated with permeable pavements for pedestrian paths, porous asphalt pavement for driveways and parking areas, and other materials to reduce runoff as part of low impact design elements. With sustainability design measures, the project should be able to achieve or get close to no net increase in storm water runoff. Any increase in runoff would be low and should not have a significant impact on the surrounding area.

The EU constructed at the Building 1180 site (proposed action) would not significantly increase the amount of impervious surface in that area because the site is already paved. Additional grassed area created for a courtyard replacing a portion of Building 1180's paved site would partially offset the amount of additional impervious area created for EU building foundations for unit wings and the maintenance building. The future design for this EU would determine the resulting change in impervious area at this site and necessary LID elements.

Construction of the EU at the Pali Kilo Beach site would increase the amount of impervious surfaces in that area because the majority of the planned site currently consists of vegetation. A portion of this EU site consists of a concrete parking area, partially offsetting the amount of additional impervious area created. However, the EU at this site would result in a greater amount of new impervious surfaces compared to the Building 1180 (proposed action) alternative.

New cottages built under these action alternatives are planned to be constructed on post and piers anchored to a poured-in-place concrete foundation (similar to existing cottages). Rain water discharging off of building roofs would be allowed to infiltrate into the ground under the building and along adjacent areas. As a result, the amount of new impervious surfaces created in this project area would be limited to these concrete foundations greatly reducing the amount of additional storm water generated from these cottages.

Storm water runoff from this project area would continue to sheet flow into lower lying areas following natural drainage patterns eventually discharging into Kaneohe Bay. Green elements planned to be considered for site development would include low impact development erosion and sedimentation plans, reducing paved areas for parking and driveways using grasscrete or other pervious products. Specific green elements and other best management practices would be developed during the design phase. As a result, increased surface runoff generated by the action alternatives should not have a significant impact on surrounding waters.

MCCS can also phase implementation of new cottages over time and evaluate the changes occurring since MCCS can construct less than the total units being proposed. The management objective of Class A designated marine waters off of Kaneohe Bay, which is to protect the waters for recreational and aesthetic enjoyment, would be continued with the action alternatives.

During construction, best management practices (BMPs) would be implemented by the contractor to minimize storm water runoff and mitigate short term effects. Specific procedures and BMP details would be determined and refined during the project's design phase. Some BMPs that could be considered for implementation include: 1) installing or deploying silt fences, snake bags or other measures to mitigate silt laden runoff from leaving the site; 2) installing a perimeter construction fence; 3) using controlled watering to allay dust during the construction work; and 4) thorough watering of disturbed areas after construction activity has ceased for the day.

The implementation of these BMP's should limit or eliminate introduction of materials originating from construction activities into the marine environment. Potential measures may include time-course monitoring during the demolition and construction activity, so that the results can validate the effectiveness of the BMP's implemented. If monitoring results indicate that there are detectable changes to conditions of the marine setting owing to construction activities, alterations can be made to BMP's to alleviate the problem. The need for such monitoring would be determined as part of the project's design phase and reviewed by applicable MCB Hawaii departments.

No Action Alternative. The No Action Alternative would not have an impact on surface waters and water quality in the project area because present site conditions would continue with MCCS operation of existing cottages.

3.12 Marine Resources

3.12.1 Affected Environment

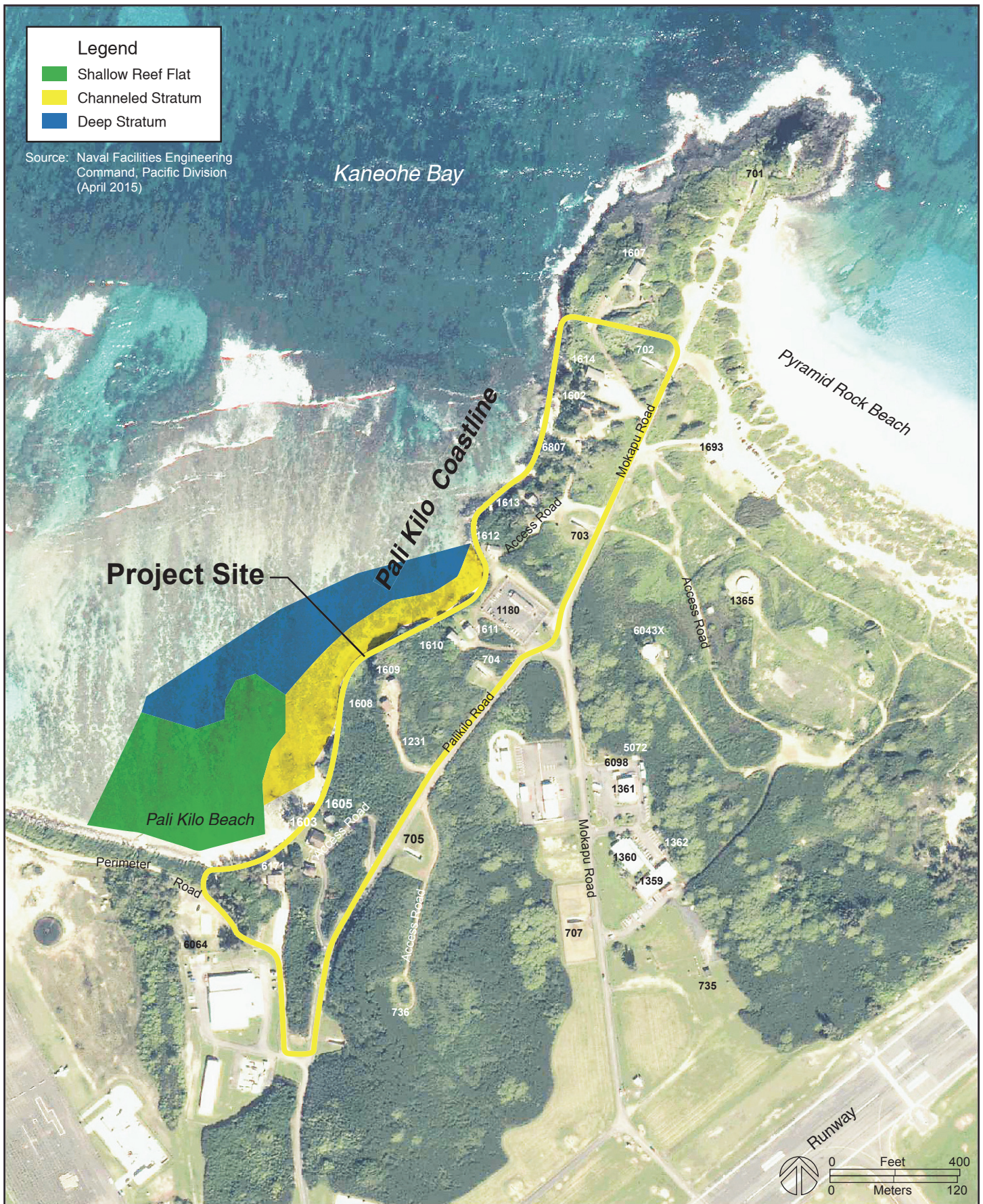
The INRMP (MCBH 2001) provides a general background of natural resources within the Base which includes marine resources. A 500-yard buffer zone around Mokapu Peninsula that is managed under MCB Hawaii Kaneohe Bay contains a matrix of marine habitats that can be grouped into four major zones based on physiographic characteristics, water motion, and freshwater influences. These include, from southwest to northeast around the peninsula, the following zones: 1) Kaneohe Bay Zone; 2) Transition Zone; 3) Open Ocean Zone; and 4) Kailua Bay Zone. The Pali Kilo coastline is situated within the Transition Zone that is generally comprised of a wide band of shallow barrier reef intersected by a dredged channel and lagoon. This zone has coral-encrusted slopes, abundant populations of 20 or more fish species, and a growing abundance of the threatened green sea turtle (*Chelonia mydas*) which feed on abundant mats of sea grass on the fine sand slopes of the lagoon (MCBH 2012).

There are also several species of marine animals in the waters off-shore of the base that have been declared threatened or endangered by the federal government and are of special protection concern. These include threatened green sea turtles (*Chelonia mydas*), the endangered hawksbill turtle (*Eretmochelys imbricata*), and the endangered Hawaiian monk seal (*Neomonachus schauinslandi*). Sea turtles regularly swim and feed in Mokapu's nearshore waters, and green sea turtle utilized the shoreline. Hawaiian monk seals infrequently haul out to rest along Mokapu shoreline beaches on the northwest and northeast coastline either side of Pyramid Rock (NAVACPAC 2015).

A baseline assessment of marine resources along the Pali Kilo coastline was conducted from 2012-2013 by a NAVACP biologist in coordination with the Natural Resource staff for MCB Hawaii Kaneohe Bay (NAVACPAC 2015). The objective was to provide a baseline assessment of the marine resources that are present along this coastline. A pre-survey site visit was conducted to determine general marine habitat characteristics. Field surveys were then conducted to assess the existing condition of the reef in order to better estimate potential effects from the project. The area fronting the project site was divided into three strata based on habitat characteristics in order to distinguish impacts among strata (shallow flat, channelized flat, and deep flat). Transect and quadrat surveys were conducted to determine the species richness and abundance of fish, algae, coral and other invertebrates, and to evaluate habitat complexity, and the presence of protected species.

3.12.1.1 Existing Marine Habitat

The marine habitat along the Pali Kilo coastline is a typical fringing reef structure with a shallow reef flat that gradually becomes deeper. Currently, the near-shore marine resources in this area experience recreational use by snorkelers, kayakers, and spear fishermen for both fish and octopus. Three relatively distinct strata were defined from surveys of the reef flat habitat just off the shoreline which are: 1) the shallow reef flat; 2) shallow reef flat with channels; and 3) the deeper reef flat. The strata is graphically depicted on Figure 3.5. Past this area, the reef flat begins to slope downward to increasing depths and wave-exposure.



Reef Strata Along Pali Kilo Coastline

Figure 3.5

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Rugosity, or habitat complexity, was greatest in the channelized strata, followed by the deep flat, and least rugose in the shallow flat strata (NAVFAC PAC 2015). The depth range occurring across strata is not large, the maximum depth at any survey location was 3.3 feet. The shallow flat and channelized strata are similar in average depth (0.65 -0.80 feet). The deep flat strata had an average depth of approximately 1.50 feet.

The shallow reef flat is exposed at extreme low tide (see Exhibit 3.10) and is therefore the region of greatest environmental fluctuation for the marine species that use that part of the habitat. The substrate is carbonate with variable levels of sand. Coral and algae are dominant members of the benthic community. Large mound forming *Porites* spp. and *Montipora capitata* (alive and dead colonies covered with algae) dominate nearshore waters (USFWS 2012). Some coral colonies exhibit a microatoll morphology which is a ring of coral colonies that grow to the water's surface upon which the center of the ring (near the surface) erodes and is colonized by reef algae. The brown alga *Turbinaria ornata* often grows on the non-living surfaces. In an adjacent nearshore habitat, the invasive alga *Acanthophora spicifera* was dominant.



Exhibit 3.10 View of Exposed Shallow Reef Flat During Extreme Low Tide Along Pali Kilo Coastline

Coral

Four species of coral and two genera that could not be distinguished to the species level were observed during baseline studies (NAVFAC PAC 2015). None of the observed coral are listed as threatened or endangered. Species richness of stony coral was low and homogenous among strata. The two most abundant species of coral were *Porites compressa* and *Montipora capitata*, and these species accounted for 98% of all coral encountered (Exhibit 3.11). The deep flat stratum was the most speciose of the three strata, where *Montipora flabelata* was observed. As the deep flat gives way to the slope, *M. flabelata* cover increases. Otherwise three additional species are also found in all strata: *Cyphastrea ocellina*, *Pocillopora* sp, and *Pavona* sp. Table 3.3 shows the percentage of live coral cover among strata by species.

Coral cover is qualitatively similar to other reef flats in Kaneohe Bay. The deep and channelized reef flats have between 32 to 35 percent coral cover, while the channelized stratum had less (22%). Coral cover on the reef slope was not quantified. The structure of coral communities in the nearshore Pali Kilo coast is similar to those found on other reef flats and wave-exposed slopes in Kaneohe Bay. However, the particular micro-atoll morphology found in the shallow flat strata is uncommon.

Coral damage was lowest in the channelized strata, where 22% of the sites had minor damage (small coral tips that were broken). It is likely that damage estimates were lower because in this stratum corals tend to grow on the sides of the channels and not on upward facing surfaces. In the deep flat strata, 42% of the sites that had coral minor damage (evenly split between new and old damage). Damage was observed in more than 50% of the sites in the shallow flat strata; 33% with minor damage, and 20% sites with large coral heads broken and turned over. In deeper water, on the reef slope, coral damage was not often observed, possibly because the dominant coral growth forms in this habitat are massive rather than branched.

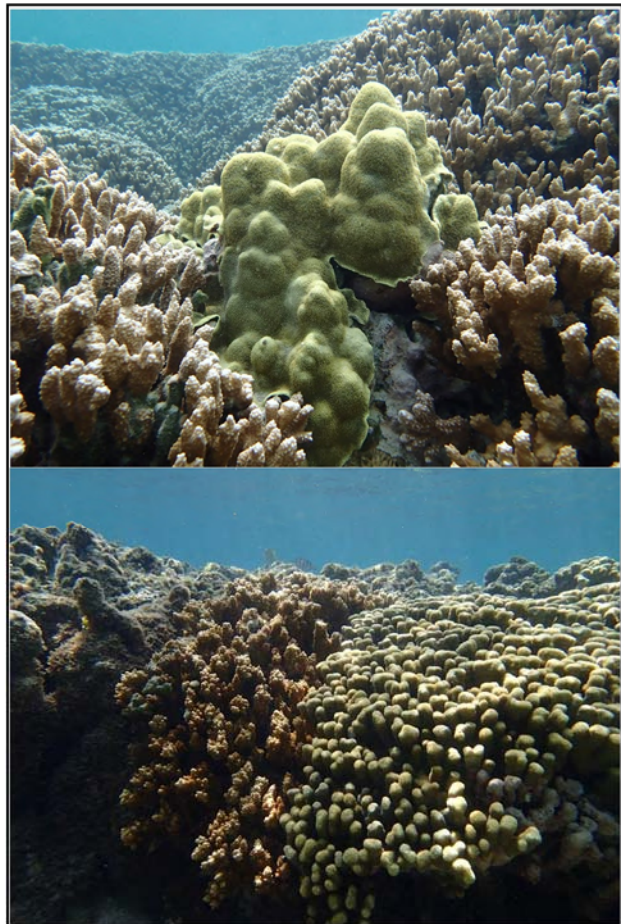


Exhibit 3.11 *Montipora capitata* (Top Photo) and *Porites compressa* (Bottom Photo) in Deep Stratum

Table 3.3 Percent Live Coral Cover Among Strata By Species, 2012 – 2013 (NAVFACPAC 2016)			
Genus Species	Shallow	Channels	Deep
<i>Porites compressa</i>	7.94	9.89	8.17
<i>Montipora capitata</i>	25.84	11.89	23.50
<i>Montipora flabellata</i>	0.00	0.00	0.01
<i>Cyphastrea ocellina</i>	0.17	0.28	0.18
<i>Pocillopora sp</i>	0.02	0.01	0.27
<i>Pavona sp</i>	0.57	0.01	0.22
Total	34.54	22.07	32.35

Algae

Across species and morphologies, algae were most abundant in the channelized strata, followed by the deep flat strata, and least abundant in the shallow flat strata. The most common macroalgae was *Dictyota* sp., followed by species of the genera *Hydrolithon*, *Acanthophora*, *Sphaecelaria*, *Padina*, *Turbinaria*, and *Acrosymphyton*. A turf alga was homogenous throughout the entire area.

Interestingly, the invasive algae, *Acanthophora spicifera*, covered large portions of the shallow flat strata nearest to shore at the beginning of surveys, however, several months later (March 2013) *A. spicifera* was isolated in small patches (1 inch tall and 12 inches wide) were present. Although algae were present at all sites, extensive growth onto healthy/live coral was not prevalent. Anecdotally, mats of cyanobacteria have been observed on the reef along Pali Kilo shoreline, and they may be advancing. Blooms of this blue-green algae are often associated with increased nutrient availability.

Fish

In baseline surveys (NAVFAC PAC 2015), reef fish species richness was similar among the three strata; 15 species were recorded in the channelized strata, 17 in the deep flat strata, and 18 in the shallow reef strata. Surgeonfish, butterflyfish, and damselfish were the most speciose across strata. None of the fish observed are listed as endangered or threatened species.

Parrotfish were the most abundant reef fish family across strata, but distinctly more abundant in the shallow flat strata. Gobies and surgeonfish were also notably abundant across strata, while wrasses, damselfish, and butterflyfish were present to a lesser extent. The shallow strata had the greatest number of fish, followed by the channelized strata, while the deep flat strata had the fewest reef fish.

Invertebrates Besides Coral

Baseline surveys (NAVFAC PAC 2015) documented a variety of mobile and sessile invertebrates other than coral in the area. These abundances were relatively consistent among strata, with a few exceptions found in Anthozoa, Vermitidae, and Porifera classes.

Bivalves were the most abundant class of organisms found and were abundant in all strata. The Hawaiian mussel, *Brachidontes crebristriatus*, was the most common bivalve observed. Gastropods (snails and sea slugs) were also homogenous among strata. Sea urchins were the most abundant echinoderm, although brittle stars and sea cucumbers were also observed. Crabs and shrimp were the most common arthropods, although some barnacles were observed. Anenomes and zoanthids were common in the shallow flat strata, less common in the deep flat strata, and absent in the channelized strata. Many vermitids (worm shells or worm snails, and crustaceans) were not identified to species, except for *Dendropoma gregaria*. Vermitids were less abundant in the deep flat strata, but abundant in other strata. Sponges (Porifera) were not common in any strata, and especially rare in the channelized strata.

At least one octopus was observed in the shallow flat stratum during the baseline surveys. It is presumed that octopus occur in the area with some regularity, because hunters come there to catch them on a regular basis.

3.12.1.2 Threatened, Endangered and Protected Species

This section describes threatened, endangered, and protected marine species that may occur within the Pali Kilo coastal area. More than 25 species of marine mammal and two species of sea turtle may occur in the U.S. Exclusive Economic Zone established around the Hawaiian Islands. Many of the marine mammal species are found in deep water (>984 feet), very distant from the Islands, or are rare visitors to the area. Therefore, the marine mammals that may be observed along the Pali Kilo coastline are limited.

The Endangered Species Act (ESA) listed Hawaiian monk seal (*Neomonachus schauinslandi*) is the only marine mammal that would enter the very shallow waters fronting the Pali Kilo project area or haul out on the limited beach areas (e.g., Pali Kilo Beach). In extremely rare cases, other species of pinniped have been seen in the Hawaiian Islands, but those incidents are so rare and are not addressed in this document. Some dolphin species that are common in the nearshore environment, such as spinner dolphin (*Stenella longirostris*) and bottlenose dolphin (*Tursiops truncatus*) may transit past the beach and reef flat in front of the project area. But, their presence would be temporary and is expected to be well outside the area where people would recreate in the water.

Two species of sea turtle, the threatened green turtle (*Chelonia mydas*) and the endangered hawksbill turtle (*Eretmochelys imbricata*), occur in the marine habitats in the Pali Kilo area and could utilize the shoreline as well. In Hawaii, the vast majority of sea turtles observed are green turtles, and they are known to bask on beaches, unlike other turtle species. Therefore, green turtles are the species that is most expected to be encountered in the Pali Kilo area.

There are no ESA-listed corals in Hawaii, but the nearshore waters along this coastline where guests would be staying and would likely be engaging in in-water recreation activities is designated as Essential Fish Habitat (EFH) by the Western Pacific Regional Fishery Management Council (WPRFMC 2009).

Hawaiian Monk Seal

All marine mammal species are protected by the Marine Mammal Protection Act of 1972 (MMPA). The Federally- and State-endangered Hawaiian monk seal is endemic to the Hawaiian Islands (i.e., found only in Hawaii), although in the past there were rare sightings of individuals at Johnson Atoll, Wake Island, and Palmyra Atoll. Individuals have a life expectancy of 25 to 30 years. The species is critically endangered, but the majority of the population is in the Northwest Hawaiian Islands.

There is a small population of approximately 130 individuals in the Main Hawaiian Islands. The population, while declining overall, is increasing in the Main Hawaiian Islands. At up to 7.5 feet long and 450 pounds (lbs), females are slightly larger than males, who are up to seven feet long and 375 lbs. Monk seals spend one-half to two-thirds of their time at sea foraging in waters surrounding atolls,

islands and on offshore reefs, submerged banks, seamounts, and deep water coral beds. Juveniles have been known to forage in sand fields.

Monk seals primarily forage on benthic and demersal prey (i.e., prey that live and feed on or near seafloor). They have a varied diet that includes fish, octopus, squids, crabs, lobster, and shrimp. Adults are generally nocturnal hunters, while juveniles forage diurnally on species that hide in the sand or under rocks (MCB Hawaii 2011). Monk seals breed and haul-out on sand, corals, and volcanic rock. The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service designated critical habitat for Hawaiian Monk Seals, but shorelines at MCB Hawaii Kaneohe Bay were excluded under the Sikes Act Improvement Act because the critical habitat of the monk seal is subject to the MCB Hawaii INRMP that provides a conservation benefit to the species.

Monk seals haul out at MCB Hawaii Kaneohe Bay occasionally. Table 3.4 contains the number of haul outs recorded and the locations. Some of the sightings are of the same seal across days and years. For example, a seal known as KC was observed 12 times in 2011, and has been observed every year since 2007, with the exception of 2014. Two seals, in particular, haul out with some regularity at MCB Hawaii Kaneohe Bay beaches. Of the 121 haul out events in Table 3.4, seven records (5.8%) are for events near the Pali Kilo project area.

Table 3.4 Seal Haul Outs Reported at MCB Hawaii Kaneohe Bay Between 2004 and April 2015		
Year	Number of Haul Outs Recorded	Beach Locations and Number of Cases
2004	9	Not recorded (4), Pyramid Rock (3), North Beach (2)
2005	3	North Beach (2), Ft. Hase (1)
2007	6	Not recorded (4), North Beach (2), Ft. Hase (1), Pyramid Rock (1)
2008	8	Cabins beach (4), Not recorded (3), North Beach (1)
2009	9	North Beach (4), Ft. Hase (2), Pyramid Rock (2), Not recorded (1)
2010	6	Pyramid Rock (3), Ft. Hase (2), North Beach (1)
2011	30	Pyramid Rick (14), Ulupau Cove (5), North Beach (5), Hilltop (3), Kii Point (2), Ft. Hase (1)
2012	17	Ft. Hase (5), Pyramid Rock (4), Cottage Cove (2), Hale Koa (2), Hilltop (2), North Beach (2)
2013	22	North Beach (12), Pyramid Rock (5), Ft. Hase (2), Hilltop (1), NCO Cottage/Seabee Cottage (1), Ulupau Cove
2014	8	North Beach (4), Pyramid Rock (2), Ft. Hase (1), Hilltop (1)
2015*	3	Pyramid Rock (3)
* Data from 2015 is from January 1 st to April 15 th only. Bolded text is for haul outs along the Pali Kilo coastline fronting the project area. Data from 2004 to 2009 are from the National Marine Fisheries Service.		

Sea Turtles

The Federally- and State-threatened green sea turtle is indigenous (i.e., native to Hawaii but also found elsewhere) and is the largest hard-shell sea turtle, averaging three feet in length and weighing 300 to 350 lbs. Green sea turtles utilize ocean beaches for nesting and open ocean and coastal areas for feeding. Adult green sea turtles are almost exclusively herbivorous and feed primarily on seagrass and algae. The endangered hawksbill sea turtle is also indigenous to Hawaii and is a small to medium sized marine turtle, averaging 2.5 feet in length and weighing 100 to 150 lbs. They frequent rocky areas, coastal reefs, shallow coastal areas and estuaries, and prefer water depths of less than 65 feet. Hawksbill sea turtles are often associated with the coral reef community and feed primarily on sponges, other invertebrates, and algae.

The Navy has conducted more than 10 years of in-water diving surveys for turtle presence at several locations around Oahu. These general density measurements estimate turtle presence on Oahu at 1.125 turtles per square kilometer (km²), with less than one percent of those being hawksbill turtles.

Green turtles haul out at MCB Hawaii Kaneohe Bay beaches on infrequent occasions; the frequency is far less than monk seal haul outs. Table 3.5 contains the number of haul outs and strandings recorded since 2011. Of the eight haul out events recorded in Table 3.5, none of the records are for events near the Pali Kilo project area. Normally, green turtles are the only species that one would expect to see on a beach at MCB Hawaii Kaneohe Bay.

Table 3.5 Turtle Haul Outs Reported at MCB Hawaii Kaneohe Bay Between 2011 and April 2015		
Year	Number of Haul Outs Recorded	Beach Locations and Number of Cases
2011	2	Pyramid Rock (1), North Beach (1)
2012	0	-
2013	2	Ft. Hase (1), North Beach (1)
2014	4	Pyramid Rock (1), North Beach (1), Waterfront Ops Boat Ramp (1)
2015*	0	-
* Data from 2015 is from January 1 st to April 15 th only.		

During the NAVFAC nearshore marine resources assessment surveys conducted in 2012-2013, no sea turtles or monk seals were observed in the action area. However, during regular monthly snorkel surveys over the past few years, Angela Richards-Dona of the University of Hawaii has reported seeing an average of two green turtles per 1 to 3 hours in this area. Typically the sea turtles are observed swimming away, presumably from either resting or foraging.

One of the records, in Table 3.5 at Ft. Hase in 2013, was of a stranding of a severely injured Olive Ridley sea turtle (*Lepidochelys olivacea*). Sightings of Olive Ridelys are generally limited in Hawaiian waters as there have been only three occasions since 1985 where this turtle was documented trying to nest on the State's shores. Failed attempts occurred on the islands of Hawaii and Maui, but the only documented successful nesting occurred in 2009 on Pyramid Rock Beach.

3.12.2 Potential Impacts

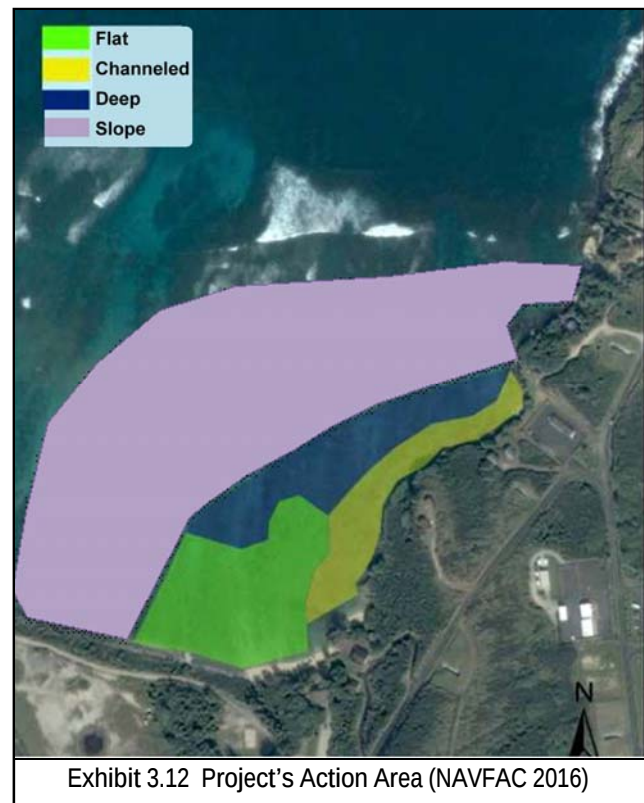
A Biological Evaluation (BE) and Essential Fish Habitat Assessment (EFHA) was prepared by Naval Facilities Engineering Command Pacific (NAVFAC PAC) to address project effects on: 1) species listed as endangered or threatened under the ESA and their designated critical habitat; and 2) designated Essential Fish Habitat (EFH) in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (NAVFAC PAC 2016). A copy of this report is included in Appendix E.

The “action area” for this project includes the area from the shoreline inland to Palikilo Road and Mokapu Road, and from Pali Kilo Beach north up to Building 1607 encompassing about 16.8 acres. The impact area also included the nearshore waters and marine resources along the Pali Kilo shoreline where construction activities would occur. A portion of the marine habitat beyond nearshore waters was also included because of possible increased recreational use of the nearshore marine environment from guests staying at these units. The extent of the area of consideration thus extends past the reef flat areas and slopes down to approximately 15 feet. Exhibit 3.12 shows the resulting project impact area.

There is no designated critical habitat for any listed marine species within or adjacent to the action area. Although coastlines on Oahu in general were designated as Hawaiian monk seal critical habitat, MCB Hawaii was excluded from this designation as a result of its lands and a 500-yard marine buffer area that is subject to an Integrated Natural Resource Management Plan. Likewise, the action area is not adjacent to the Hawaiian Islands Humpback Whale National Marine Sanctuary.

Action Alternatives. The green sea turtle, the hawksbill sea turtle, and the Hawaiian monk seal are protected under the ESA. Among the protections afforded these species under that act is protection from being physically harmed and/or harassed. Additionally, Hawaiian monk seals are protected by the Marine Mammal Protection Act (MMPA). Both laws require people to actively avoid interactions with protected species and to maintain distances that do not negatively impact animal behaviors. The project has the potential to interact directly and indirectly with ESA-listed species through the following stressors:

1. Disturbances from human presence and recreational activities (construction and marine areas);



2. Exposure to elevated noise levels during construction; and
3. Exposure to sedimentation, wastes, and discharges.

Disturbance from Human Presence (Construction Area). Both green sea turtles and Hawaiian monk seals have the potential to use the Pali Kilo Beach cove at the Pali Kilo shoreline to haul out. Likewise, it is conceivable, however unlikely, that both hawksbill and green sea turtles could nest at this cove. If seals and/or turtles were out of the water and utilizing the shoreline, they would be vulnerable to direct impacts from disturbance as a result of construction activity nearby. Once construction is completed, seals and turtles utilizing the shoreline would be vulnerable to indirect impacts via disturbance from guests staying at new cottages and EU.

The likelihood of disturbance to protected species on land is low. Only a small percentage (5.8%) of Hawaiian monk seal haul outs have been recorded along the Pali Kilo coastline since 2004, and only one has ever been documented pupping along this shoreline. No sea turtle haul outs, nestings, or strandings have been recorded in this area. Both Hawaiian monk seals and sea turtles seem to prefer to utilize the nearby Pyramid Rock Beach, which is a big sandy beach on the north side of this peninsula. This preference is likely because Pyramid Rock Beach is easily accessible, being adjacent to deep water. The Pali Kilo reef flat is very shallow; therefore, getting to the shoreline easily is limited to the period around high tide, and much of the shoreline (except Pali Kilo Beach) is rocky and steep.

Direct effects to protected species will be abated through the implementation of construction BMPs to ensure that utilization of the shoreline habitat is systematically monitored for ESA-listed species presence, and the appropriate measures are in place to ensure maximum protection from disturbance during construction. For example, if a haul-out is detected, construction will be suspended within 50 yards. Additionally, the new lodging units will be constructed with outdoor lighting fixtures that contain design elements to minimize light pollution along the shoreline (e.g. shielding).

For the long term, MCB Hawaii policy dictates that when sea turtles and/or monk seals haul out on land, MCB Hawaii natural resources staff follows a series of protective conservation measures that are used on many beaches in Hawaii. These conservation measures include posting signs that direct the public to stay away from and not disturbing the protected animals, and erecting physical barriers to separate humans from the animals, which ensures compliance with the ESA and MMPA. Where these conservation measures are followed, indirect impacts to sea turtles and seals will be minimized, and they can safely haul out without disturbance or harm coming to them. Therefore, human physical presence on land may affect, but is not likely to adversely affect protected species because effects would be insignificant.

Disturbance from Human Presence (Marine Area). While in the marine environment, Hawaiian monk seals, green sea turtles, and hawksbill sea turtles may be indirectly impacted by recreational activities such as snorkeling, swimming, and spearfishing. Sea turtles utilize the marine environment on the Pali Kilo coast as forage areas, for resting or refugia, or simply transiting through. Likewise, Hawaiian monk seals are in the Pali Kilo coast marine environment as well, most likely in transit. As such, seal and sea turtles are susceptible to disturbance by human physical presence in the marine environment, which

may cause them to alter their behavior. However, these protected species are highly mobile and able to avoid direct impacts from this type of disturbance. Therefore, human presence in the water may affect, but is not likely to adversely affect protected species because effects would be insignificant.

Green and hawksbill sea turtles, and Hawaiian monk seals, can be directly impacted by derelict fishing gear, including hooks, line, and weights. Like other marine debris, these abandoned items can puncture tissues, become entangled around, and/or be ingested by protected species, causing significant injury and possibly mortality.

Passive human interactions with protected species and selection of appropriate fishing techniques that do not harm protected species can be encouraged through various outreach and enforcement efforts. Successful outreach conducted by MCCA includes enacting policies, creating educational and regulatory signage, and providing outreach materials that educate guests on behaviors that avoid and/or minimize impacts to protected species. Successful outreach is accompanied by consistent enforcement of enacted policies, in addition to base, state, and federal laws. Therefore, fishing interactions may affect, but are not likely to adversely affect protected species.

Exposure to Elevated Noise Levels During Construction Area. Both green sea turtles and Hawaiian monk seals have the potential to use the Pali Kilo Beach cove at the Pali Kilo shoreline to haul out. Likewise, it is conceivable, however unlikely, that both hawksbill and green sea turtles could nest at Pali Kilo Beach cove. While on land, these protected species are capable of hearing project-related noise. If these sounds are loud enough, they may cause direct impacts.

Hawaiian monk seals can perceive frequencies between 75 hertz (Hz) and 75 kilohertz (kHz). Sea turtles have low-frequency hearing, with their greatest sensitivity being below 1 kHz. Sea turtle hearing is poorly understood; however, the best available information suggests sea turtles can hear low frequencies between 200 and 700 Hz. NMFS identifies general exposure thresholds for construction activities: 1) the onset of hearing injury for cetaceans is exposure to 180 dB re 1 micro Pascals (μ Pa) root mean squared (rms), and 190 dB re 1 μ Pa rms for pinnipeds; 2) the onset of behavioral disturbance for all marine mammals is 160 dB re 1 μ Pa rms for impulsive sounds and 120 dB re 1 μ Pa rms for non-impulsive sounds. In the absence of turtle-specific thresholds, the marine mammal thresholds are applied and are believed to be conservative for sea turtles.

Best management practices implemented during construction will include regular surveys of the shoreline to detect the presence of protected species when they haul out to rest, bask, and/or nest. These BMPs require work stoppages and protective measures, which would minimize impacts to protected species from elevated noise during construction. Therefore, noise levels during construction may affect, but are not likely to adversely affect protected species because effects would be insignificant and unlikely to occur.

Exposure to Sedimentation, Wastes and Discharges. The construction of additional cottages and the EU could increase stormwater runoff, and increase the potential for Hawaiian monk seals, green sea turtles, and hawksbill sea turtles to experience direct and indirect impacts from sedimentation, wastes, and discharges from these facilities. Construction BMPs will ensure that runoff is contained on-site during construction to protect water quality in nearshore waters adjacent to the Pali Kilo shoreline. Likewise, any accidental hazardous waste spills will be contained and prevented from entering the marine environment. During construction, the shoreline will be well protected by silt fences and/or coir logs to prevent erosion and runoff during rainfall. Therefore, exposure to increased runoff carrying sediments, wastes, and discharges may affect, but are not likely to adversely affect protected species because effects would be insignificant.

The preventative architectural and engineering design elements will ensure runoff is retained on-site over the long-term to avoid increased runoff into the shoreline and nearshore habitats. Conservation measures will be in place to prohibit the clearing of trees along the shoreline and creating of social trails. Therefore, exposure to increased runoff carrying sediments, wastes, and discharges may affect, but are not likely to adversely affect protected species because effects would be insignificant.

No Action Alternative. The No Action Alternative would not have short or long-term impacts to marine mammals because present site conditions would continue with MCCA operation of existing cottages. MCB Hawaii policy for guests at existing cottages would continue when sea turtles and/or monk seals haul out on land. Conservation measures implemented would minimize indirect impacts to sea turtles and seals. In the marine environment, Hawaiian monk seals, green sea turtles, and hawksbill sea turtles could continue to be indirectly impacted by current guest recreational activities such as snorkeling, swimming, and spearfishing. These species would also continue to be directly impacted by derelict fishing gear, including hooks, line, and weights. However, these protected species are highly mobile and able to avoid direct impacts from this type of disturbance. Selection of appropriate fishing techniques that do not harm protected species can be encouraged through MCCA outreach and enforcement efforts. Therefore, human presence in the water along with fishing interactions would continue to have an insignificant effect on these protected species.

3.12.3 Essential Fish Habitat

Current Conditions and Effects on Habitat

The nearshore environment fronting the Pali Kilo project area falls within designated Essential Fish Habitat, or EFH. Table 3.6 contains the description of the EFH and habitat areas of particular concern (HAPC) for the management unit species (MUS) designated by the Western Pacific Regional Fishery Management Council (WPRFMC).

Table 3.6 EFH and HAPC Designations Relevant to the Pali Kilo Project Area			
	MUS Complex	Essential Fish Habitat	HAPC
Bottomfish and Seamount Groundfish	Shallow-water species (0–50 fm): uku (<i>Aprion virescens</i>), thicklip trevally (<i>Pseudocaranx dentex</i>), giant trevally (<i>Caranx ignobilis</i>), black trevally (<i>Caranx lugubris</i>), amberjack (<i>Seriola dumerili</i>), taape (<i>Lutjanus kasmira</i>)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm) Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	N/A
Bottomfish and Seamount Groundfish	Deep-water species (50–200 fm): ehu (<i>Etelis carbunculus</i>), onaga (<i>Etelis coruscans</i>), opakapaka (<i>Pristipomoides filamentosus</i>), yellowtail kalekale (<i>P. auricilla</i>), kalekale (<i>P. sieboldii</i>), gindai (<i>P. zonatus</i>), hapuupuu (<i>Epinephelus quernus</i>), lehi (<i>Aphareus rutilans</i>)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm) Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	N/A
Crustaceans	Spiny and slipper lobster complex: Hawaiian spiny lobster (<i>Panulirus marginatus</i>), spiny lobster (<i>P. penicillatus</i> , <i>P. spp.</i>), ridgeback slipper lobster (<i>Scyllarides haanii</i>), Chinese slipper lobster (<i>Parribacus antarcticus</i>) Kona crab : Kona crab (<i>Ranina ranina</i>)	Eggs and larvae: the water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm) Juvenile/adults: all of the bottom habitat from the shoreline to a depth of 100 m (50 fm)	N/A
Coral Reef Ecosystems	All Currently Harvested Coral Reef Taxa All Potentially Harvested Coral Reef Taxa	EFH for the Coral Reef Ecosystem MUS includes the water column and all benthic substrate to a depth of 50 fm from the shoreline to the outer limit of the EEZ	Kaneohe Bay
Source: Fishery Ecosystem Plan for the Hawaii Archipelago (WPRFMC, 2009) fm – fathoms; EEZ – exclusive economic zone			

Currently, the near-shore marine resources in this area are affected by recreational use by snorkeling, kayaking, and fishing (both rod and reel and spear) activities. Coral damage was observed in all parts of the study area with the most damage found closest to the shoreline. It is probable that the entire study area is currently impacted by snorkelers, spearfishers, tako (octopus) hunters, and other users.

Due to very shallow depths adjacent to the shore, it is likely that users walk, crawl, and/or stand in these areas, possibly causing coral damage. Additionally, it is likely that spearfishers miss their targets, causing minor damage to live corals. However, it is notable that corals with minor damage did not appear to be stressed, and overall health did not appear to be jeopardized. Additionally, the overturned heads of coral found in several locations along the flat and channeled strata, had continued to grow and some of them had coral growing upward, demonstrating recovery. It is likely that tako hunters are responsible for overturning the large coral heads in pursuit of octopus. Both spearfishers and tako hunters were frequently observed in the vicinity during the surveys. It is unknown if resource use is predominantly related to the Marine Corps Base Hawaii residents, or from nearby local communities. MCB Hawaii allows fishing and octopus harvest in the study area, however, damage to coral and live rock is prohibited.

In deeper water, such as the deep flat area, where people can begin to swim comfortably, coral reefs are less likely to experience impacts from snorkelers standing, walking, or crawling on the substrate. In the channelized flat area, corals predominantly grow on the sides of the channels, but not on the upward-facing surfaces. It is unclear if this is due to long-term impacts by recreational users (walking on the reef), or as a response to environmental variables (e.g. light intensity, temperature). Recreational users could walk in the sand channels and impact corals. However, it is unlikely based on low levels of damage observed there, and a general tendency for people to walk in the shallowest area available.

The entire reef flat study area has a high likelihood of being affected by recreational users because it is adjacent to the Pali Kilo Beach access point and is shallow. Users who enter the water from that location are very likely to walk out on the reef until they reach deeper water. Anthropogenic impacts from recreation present an interesting challenge, because solutions are all based in regulating and influencing human behavior.

Fishes and Habitat in Project Area

Of the three reef flat strata along the Pali Kilo shoreline, the channelized and shallow reef flats are most likely to experience impacts from increased recreational use as a result of the project. Within those strata, the seafloor and the water column are both considered EFH for coral reef, bottomfish, and crustaceans. The reef slope stratum is unlikely to experience adverse impacts.

Shallow Flat. This is the area fronting Pali Kilo Beach and slightly toward the west. Massive corals dominate this strata, especially *Montipora capitata* and to a lesser extent *Porites compressa*. These two species comprise 98 percent of all live coral cover in this area, and exhibit “micro-atoll” coral morphology. The other three corals common among strata are present in very low abundances. The invasive algae *Acanthophora spicifera* appears to colonize the substrate here seasonally. Juvenile parrotfish, which are found in great numbers, likely use this area a refugia from predators which are limited by the shallow depths in this strata. Gobies are also found in abundance. Mussels, worm snails, and small crustaceans are common.

Channelized Flat. This is the area fronting Pali Kilo Beach following the shoreline toward the east. This strata is dominated by algae to a greater extent than the other two strata. Like the shallow flat, depth here is very shallow. This stratum has the least amount of live coral cover of the entire action area. Where corals are found, they tend to line the sandy channels that are characteristic of this area. Gobies are the most abundant type of fish found, as well as juvenile parrotfish. Sponges are under-represented compared with other strata, and anthozoids are absent.

Deep Flat. This is the slightly deeper area north of both the shallow and channelized flats. The percentage of coral cover is similar to the shallow flat (35%), but only the *Montipora flabelata* was observed here. A slight shift in the fish community is exhibited here, from juvenile parrotfish and gobies to larger bodied surgeonfish and wrasse. Additionally some uncommon predators were found here (lizardfish and morey eel). Snails, crabs and shrimp were found in notably fewer numbers in this strata that is deeper and more suitable for predatory fishes. Urchins are slightly more abundant here than in the more shallow areas.

Reef Fish. Reef fish species were similar throughout the action area; 15 species were recorded in the channelized strata, 17 in the deep flat strata, and 18 in the shallow reef strata. Overall, 27 species of fish were identified with surgeonfish, butterflyfish, and damselfish being the most abundant families. Reef fish abundances were grouped by family, totaled, and averaged for comparison among strata.

Assessment of Impacts to Essential Fish Habitat

The nearshore area around the project's Pali Kilo coastline has been designated as Essential Fish Habitat (EFH), for several management unit species (MUS), and Kaneohe Bay is a habitat area of particular concern for Coral Reef Ecosystem. Adverse impacts are expected only on the reef flat, not the reef slope, and therefore the reef slope is omitted from further impacts analysis.

The construction of new cottages could increase stormwater runoff and increase the potential for EFH and MUS on the reef flat to experience adverse impacts from sedimentation, wastes, and discharges. Construction BMPs will ensure that runoff is contained on site during construction activities to protect water quality of nearshore waters. Likewise any accidental hazardous waste spills will be contained and prevented from entering the marine environment. During construction, the waterfront will be well protected by silt fences and/or coir logs to prevent erosion and runoff during rain. Therefore, exposure to increased runoff carrying sediments, wastes, will be minimized and adverse impacts to EFH and MUS will be negligible.

The preventative architectural and engineering design elements of the cottages will ensure runoff is retained onsite over the long-term to avoid increased runoff into the shoreline and reef flat habitats. Conservation measures will be in place to prohibit the clearing of trees along the shoreline and creating social trails. Therefore, increased runoff over the long term that could carry sediments, wastes, and discharges will be minimized and adverse impacts to EFH and MUS on the reef flat will be negligible.

Recreational activities along the Pali Kilo shoreline and on the nearshore reef flat has the potential to adversely affect EFH. When people swim and/or snorkel in shallow marine habitats, they cause adverse impacts to mobile MUS, causing them to alter their natural behavior, and by re-suspending sediments. It is possible that it will be more difficult for demersal fish and crustaceans to find prey due to increased turbidity and human presence. However, these MUS are highly mobile and able to actively avoid impacts by snorkelers and swimmers. Corals could also experience impacts from sediment re-suspension, causing a loss of energy from photosynthetic symbionts and a metabolic loss in resources diverted to sloughing off sediments. These impacts are expected to be temporary and minimal, and similar to natural processes that occur in this area from wave and tidal action.

Adverse impacts to EFH and MUS could occur on the reef flat as a result of poorly informed recreational users: kayakers, fishers, snorkelers, spearfishers, and octopus hunters. Fishers can have adverse impacts to EFH and MUS through targeted harvest and by damage to the substrate itself through improper fishing techniques. There is evidence at this time that recreational users cause damage to the corals on the reef flat by: 1) walking, standing on or dragging kayaks on the reef flat; 2) fishers who hitting the shallow reef flat substrate with spears and leave derelict fishing gear (hooks, line, weights); and 3) by

moving rocks and coral in pursuit of octopus on the nearshore shallow reef flat. These adverse impacts could be substantial, and most would be permanent, except for derelict fishing which could be removed.

Conservation measures to minimize of all potential long-term adverse impacts to EFH and MUS from recreational users of the project will include improved education and outreach, and improved compliance with state and MCB Hawaii regulations, and applicable environmental laws. Other measures include: 1) creating a designated launch area at Pali Kilo Beach for kayakers and paddle-boarders to enter and exit the water; 2) controlling the proximity of vehicle access to the shoreline through landscaping and possibly boulders; 3) exploring options for discouraging people from venturing out over the reef flat during very low tides; 4) consider designating areas in the cove for different types of activities, possibly using buoys as markers; and 5) increased patrolling of the grounds for removal of rubbish and reporting unauthorized or unacceptable recreational behavior to law enforcement officials. MCB Hawaii will coordinate with the National Marine Fisheries Service and the MCB Hawaii Environmental Department in developing these conservation measures.

Outreach material, including a mandatory video for each guest, will be included as part of their registration and check-in processing. These materials will direct guests on how to enjoy the marine environment without harming it, including navigating tides to avoid harming the reef at low tide. The content will be made available to MCB Hawaii from MCB Hawaii, Environmental Department. People seeking a recreational experience without these prophylactic measures for marine resource protection will be directed to other beaches, such as Pyramid Rock Beach. The combination of outreach, education, and the highly compliant guests will effectively minimize adverse impacts on EFH and MUS.

EFH Findings and Determination

Under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC §1801 et seq.), consideration of the project on EFH was conducted by NAVFACPAC. Consultation with the National Marine Fisheries Service (NMFS) was conducted in a NAVFACPAC January 25, 2016 letter, which included a Biological Evaluation (NAVFACPAC 2016).

NAVFACPAC determined that the project's impact area is terrestrial; however, future impacts to essential fish habitat are possible as a result of increased recreational activity in the nearshore marine environment. NAVFACPAC has determined that the proposed project may affect EFH, but effects will be minimal and insignificant because conservation measures can be taken to minimize and avoid adverse effects on EFH. Negative effects to EFH can be mitigated through cooperative education, various conservation measures previously discussed, and outreach programs implemented by MCB Hawaii. Conservation measures included in the Biological Evaluation identifies specific measures to be implemented.

A February 26, 2016 letter from the NMFS was received concurring that adverse effects to EFH would be minimal based upon implementation of conservation measures proposed to mitigate project effects. A March 31, 2016 letter from NAVFACPAC to NMFS concurred with their recommendations on conservation measures. This correspondence is included in Appendix C.

3.12.4 Section 7 Consultations (ESA)

Section 7 consultation under the Endangered Species Act (ESA) of 1973, as amended (16 USC §1531 et seq.) was conducted by NAVFACPAC for this project. Informal consultation under this process was conducted with both the U.S. Fish and Wildlife Service (FWS) and NMFS in letters both dated January 25, 2016. NAVFACPAC determined that this project “may affect, but is not likely to adversely affect” (NLAA) ESA protected species. Concurrence of this determination by both FWS and NMFS along with copies of NAVFACPAC consultation letters are included in Appendix C.

Listed species within this action area under FWS jurisdiction were identified to be the: 1) threatened green sea turtle (*Chelonia mydas*); and 2) endangered hawksbill sea turtle (*Eretmochelys imbricata*). Listed species under consultation with NMFS included the endangered Hawaiian monk seal (*Neomonachus schauinslandi*) in addition to the threatened green sea turtle (*Chelonia mydas*) and endangered hawksbill sea turtle (*Eretmochelys imbricata*).

Direct effects related to construction of new cottages and the EU include impacts from human presence, disturbance from construction noise, and exposure to sedimentation, wastes, and discharges. Some construction activities may be far enough away from the shoreline and/or have topographic features that block direct effects from construction-related activities. Short-term construction-related effects would be mitigated through implementation of extensive BMPs. Indirect effects include disturbance from human recreational activities from increased cottage visitors along the shoreline and in the marine environment.

These effects would be mitigated through extensive outreach and education of guests, and by enforcement of MCB Hawaii Kaneohe Bay regulations governing use of these cottages. Proposed conservation measures and BMPs are addressed in a Biological Evaluation (NAVFACPAC 2016) included in Appendix E. Outreach and signage would ensure that guests have the knowledge to act and report responsibly in the event that protected species haul out on the Pali Kilo shoreline. MCB Hawaii Kaneohe Bay conservation measures for managing haul outs will further minimize and protect ESA listed species along this shoreline.

Determination with FWS

Project impacts would be insignificant in scope and duration, and no taking of any listed species is expected. There is also no critical habitat designated within the action area. Therefore, it was determined this project may affect, but is not likely to adversely affect ESA species listed, because the effects, if any, will be insignificant. The FWS concurred with the determination in a March 18, 2016 letter.

Determination with NMFS

Project impacts would be insignificant in scope and duration, and no taking of any listed species is expected. There is also no critical habitat designated within the action area. Therefore, it was determined this project may affect, but is not likely to adversely affect ESA species listed, because the effects, if any, will be discountable. The NMFS concurred with the determination in a June 9, 2016 letter.

3.13 Cultural Resources

Previous archaeological investigations on Mokapu Peninsula are numerous and well documented. There are three primary clusters of archaeological resources that have been studied on the peninsula: 1) the Pali Kilo area in the northwest; 2) Mokapu Burial Area along the north shore; and 3) the Nuupia Fishpond Complex at the southern end of the peninsula. For this project, an archaeological survey with testing was conducted by Pacific Consulting Services, Inc. (PCSI 2015) for the planned recreational cottages and the EU complex. A report documenting the results of this work was completed in February 2015, and information from that unpublished report is incorporated in this section.

The archaeological survey work involved three activities: 1) systematic archaeological surface survey; 2) non-systematic (judgment-based) shovel-test excavations; and 3) limited controlled test excavations. The objectives of the study were to determine if previously known or unknown archaeological and historic sites and deposits were present, and to evaluate their significance against National Register of Historic Properties (NRHP) criteria and make recommendations based on the findings. Likewise, recorded archaeological and historic resources were evaluated against criteria established in the proposed NRHP Mokapu House Lots Archaeological District at Pali Kilo.

3.13.1 Affected Environment

3.13.1.1 Historical Background

Traditional Hawaiian Land Use

Traditional Hawaiian land use on Mokapu Peninsula included subsistence farming, fishing, salt manufacture, and human burial. The Nuupia Fishponds were a valuable and important fishery not only during the pre-Contact period, but well into the post-Contact period (post A.D. 1778). The manufacture of salt occurred at a salt works at Kaluapuhi Pond, known as the Paakai salt works. Salt was manufactured here into the early twentieth century (1902) until Paakai was transformed into a pond by channel dredging (PCSI 2015).

Historical accounts describe possible war-related activities near Mokapu Peninsula. Early in the eighteenth century, forces from Hawaii Island and Molokai, led by Alapai, tried to conquer Oahu. Driven off the shores of Waikiki and Waialae, Alapa then headed for Oneawa. In 1737, Peleioholani of Kauai arrived on Oahu to meet with Alapai in Kailua and stop the bloodshed that was accomplished with great formality. Subsequently, one account is that Peleioholani became the ruling chief of Oahu and Mokapu

Peninsula became his royal seat. Another account is that he probably did not live on the peninsula, but rather at Kailua like other chiefs of the region (PCSI 2015).

Historical Land Use

Evidence of small-scale subsistence farming on the peninsula continued until sometime after 1850, when a ranching economy was emerging. Around 1830, the Kaneohe ahupuaa was considered by a chiefs' council to be the most valuable portion of the Koolaupoko District, largely because of its many fishponds. Economic activities during this period included cultivation of sweet potato and other crops, fishing, shellfish collection, and salt production.

Claims submitted to the Board of Commissioners to Quiet Land Titles at the time of the Mahele indicate that Land Commission Award (LCA) 10613, Heeia ahupuaa, included lands both on the peninsula and on mainland Oahu granted to Abner Paki. When Mr. Paki died, his estate sold 435 acres of his Heeia land on Mokapu Peninsula and his fishery in the bay to John and William Sumner. The Sumner land was later deeded to John Wyllie Davis, whose family built homes there during the 1920s and 1930s (PCSI 2015).

Recent Land Use History

A number of early twentieth-century land uses are noted for the western portion of the peninsula (in or near the project area). Residential use is reflected by the presence of historic house foundations along the western shore. Historical maps illustrate the former presence of residences such as the Date family at the southwest point of the peninsula, a Chinese caretaker near the southern boundary of Nuupia Pond, and the Davis residence on the west coast.

Small scale ranching or animal husbandry is indicated by the presence of pasture lands in areas inland from the western shore and a corral along the coast. Agriculture is also represented by a coconut grove at Davis Point, and corn, sweet potato, and cotton fields in areas inland from the western shore. By the 1930s, portions of the peninsula were dominated by sweet potato patches, corn fields, and cattle ranch lands. Watermelon patches may have been located further east. Pasturelands, cattle walls, and agricultural fields dominated the interior of the peninsula. Both the Kaimuki Land Company and the Mokapu Land Company were administering most of the former Sumner lands in Heeia ahupuaa. Summer homes were built on some properties during the 1930s (PCSI 2015).

In May 1939, the Mokapu house lots became a residential district with the vote of the City's Planning Commission. Lot owners wanted to protect the area from business or military development. By 1940, roughly 90 percent of the 400 Mokapu house lots had been sold. However, the United States government acquired the western portion of the peninsula via condemnation and the land was purchased in stages from 1939 to 1941 for a naval reservation (PCSI 2015).

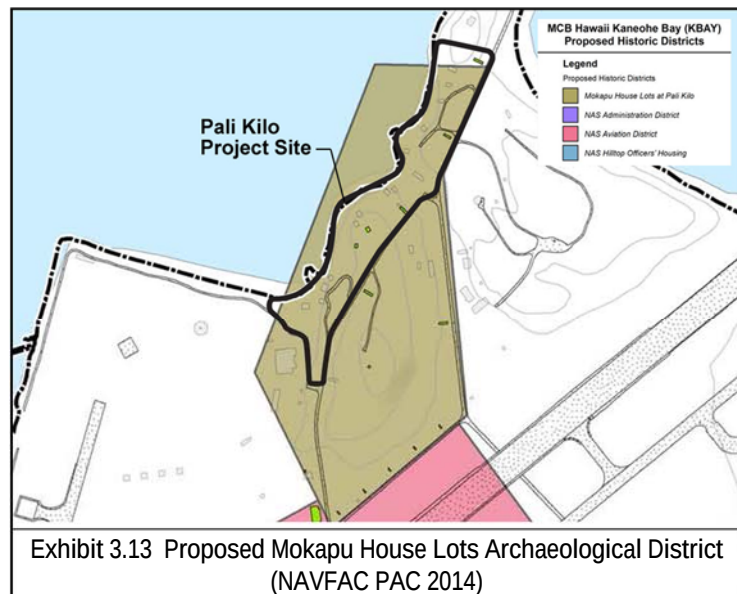
The U.S. Army acquired a 322-acre portion of eastern Mokapu Peninsula in 1918 and established Kuwaahe Military Reservation. The Army reservation was established when all the pre-military activities were occurring on the west side of the peninsula. At the end of World War I, the reservation was deactivated. In 1939, it was reactivated as Fort Kuwaahe. Around the same time, the Navy

acquired nearly 500 acres in Heeia, on the west side of Mokapu Peninsula and established Kaneohe Naval Air Station as a seaplane base, which included construction of the runway. By 1941, the runway was completed, and a second runway was completed in 1944 (PCSI 2015).

Expansion of the air station between 1939 and 1945 involved extensive dredging of marine sediments to use as fill along the shoreline and other low areas to create useable dry land. In 1952, the entire peninsula was commissioned as the Kaneohe Marine Corps Air Station. In 1994, the Marine Corps consolidated all of its installations and facilities in Hawaii under a single command which is Marine Corps Base Hawaii (PCSI 2015).

Mokapu House Lots Archaeological District

The proposed Mokapu House Lots Archaeological District has a focus on the early 20th century residential development at Pali Kilo (Exhibit 3.13) (*Update to the Integrated Cultural Resources Management Plan (ICRMP); Marine Corps Base Hawaii; 2014-2019* (NAVFAC PAC 2014)). The area incorporates 14 historic era and traditional Hawaiian sites at Pali Kilo. The area consists of the remains of early 20th century house sites that were part of a 350-lot residential subdivision dating from 1932 to 1941. Remains include concrete slab foundations, concrete and lava rock foundations and retaining walls, concrete and lava rock wells/cisterns, and related features in yard areas (e.g., sidewalks, driveways, planting areas, outdoor fireplace, sitting areas). The area within the proposed Mokapu House Lots Archaeological District reflects a period of change from agriculture and ranching activities to residential development by prominent families from Honolulu. Thus, there is considerable potential for subsurface archaeological evidence, in the form of trash deposits and buried building features.



The historic sites within the Mokapu House Lots Archaeological District are important because of their association with the increasing settlement of the Kaneohe area, beginning about 1921 with the paving of the Pali Road and continuing through World War II. During the 1920s and 1930s, residential areas were developed on Oahu from large estates and former agricultural land which provided housing for an increasing island population. This was a time when people were moving out of urban Honolulu to residential subdivisions along the south and windward sides of Oahu. As roads and other transportation infrastructure improved, homeowners were able to take advantage of housing opportunities farther

from the business center of Honolulu. This allowed persons to build in this area either vacation cottages or residences, and commute over the Pali to jobs in the business center.

As a proposed historic archaeological district, the properties of the Mokapu House Lots Archaeological District at Pali Kilo meet National Register Criterion A and D because these sites may be associated with events that have made a significant contribution to the broad patterns of history and additional archaeological survey and testing may yield important information regarding Hawaiian pre-Contact history and post contact history. The context of the residential development of Mokapu before the peninsula was taken for a military reservation in 1940, and of the historic context of Windward Oahu during the time when subdivisions were becoming a viable option to persons wishing to live someplace other than Honolulu has been sparsely documented (NAVFAC PAC 2014).

3.13.1.2 Identification of Existing Historic Properties

The project area is within the western to northern section of the NRHP proposed Mokapu House Lots Archaeological District at Pali Kilo (NAVFAC PAC 2014). This proposed archaeological district of about 65 acres is located on the northwest side of the Mokapu peninsula, between the Pacific Ocean and the runway of the MCB Hawaii Kaneohe Bay. Contributing traditional Hawaiian archaeological sites are present. These sites contain features representing multiple periods of occupation and use. Some sites contain historical and modern structures that have been built on top of traditional Hawaiian archaeological features. Other sites have been heavily impacted by historical construction activities. Table 3.7 provides a summary of previously recorded historic properties within the project area.

Table 3.7. Previously Recorded Archaeological Sites within Project Area				
SIHP Number (50-80-11-)	Site Type	Probable Age	Site Function	Reference
367	Fishing shrine, fishpond and walled enclosure	Pre-Contact	Ceremonial/Aquaculture	Drolet et al. (1996); McAllister (1933); Tuggle and Hommon (1986)
2883	Residential complex with subsurface component	Pre/Post-Contact	Habitation	Anderson (1998); Drolet et al. (1996); O'Day (2007); Tuggle and Hommon (1986)
4610	Residential complex	Post-Contact	Habitation	Drolet et al. (1996)
4611	House foundations	Post-Contact	Habitation	Drolet et al. (1996)
5733	Cultural deposit	Pre/Post-Contact	Possible Habitation	Rosendahl (1999)

Site 367 is a multi-component site located along the shoreline that includes a fishing shrine, fishpond, and a walled enclosure. The walled enclosure was later recorded as a stone wall with other concrete structural remnants. Recent projects in the Pali Kilo area have identified mostly post-Contact period residential sites dating to the early to mid-twentieth century. Below historic era deposits have also been noted. Sites 2883 and 5733 likely represent a continuous pre-contact occupation along the northern Pali Kilo coast.

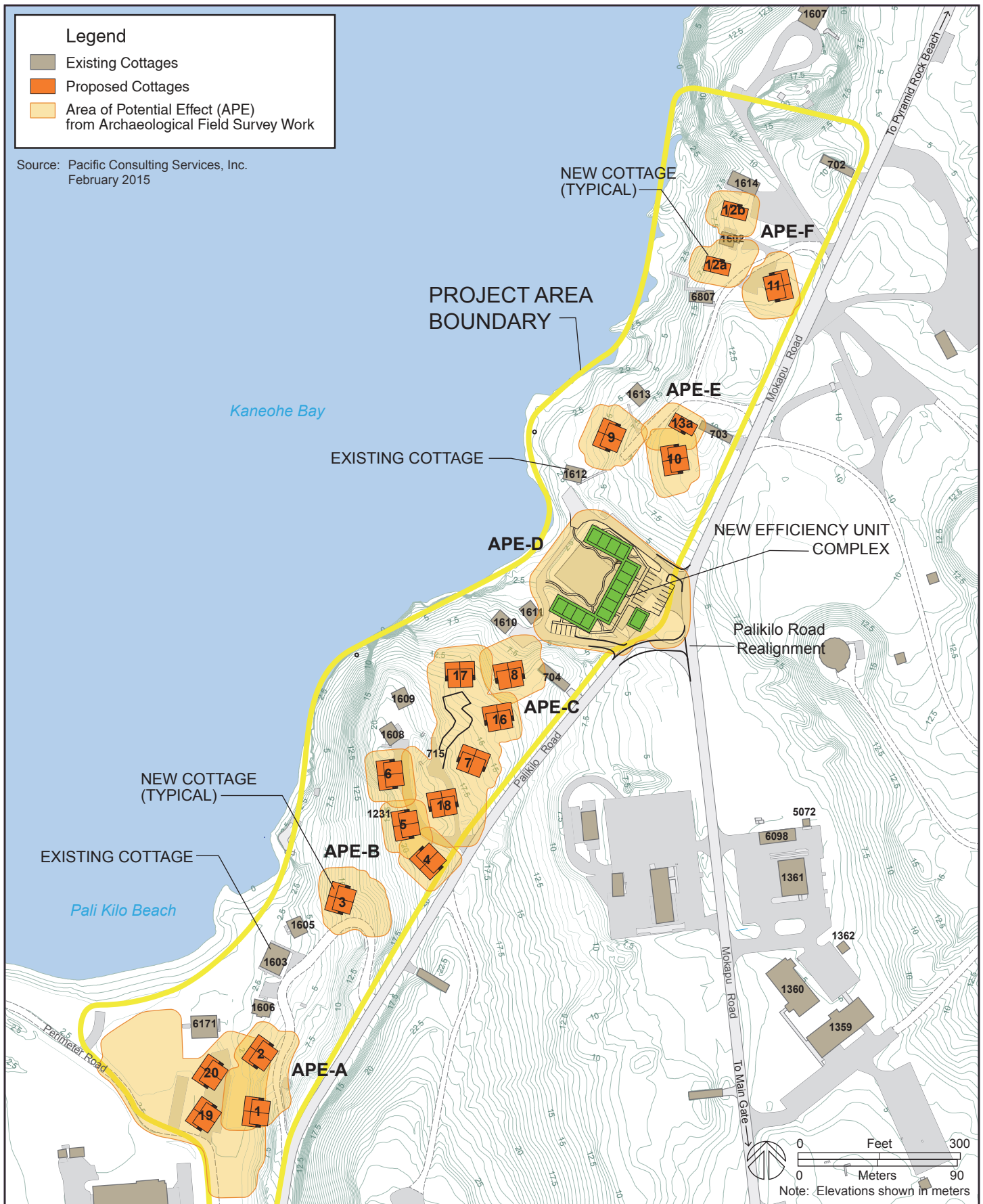
Site 2883 is a pre-Contact cultural layer. This cultural layer is a multi-component archaeological site with a non-contiguous pre-Contact deposit as well as above-ground basalt and mortar walls dating to the mid-twentieth century.

Site 5733 includes a pre-Contact archaeological deposit, nineteenth century historic components (ceramics and glass beads previously recovered), and a mid-twentieth century component consisting of subsurface deposits as well as above-ground basalt and mortar wall segments.

Area of Potential Effect

The area of potential effect (APE) established under the archaeological survey (PCSI 2015) consisted of each cottage building footprint, the area of ground disturbance around each footprint, and a 20-foot buffer around these components. The APE boundary was also modified to include anticipated areas where utility trench corridors serving cottages extend beyond the 20-foot buffer created around cottage footprints. Some of these APE areas for cottages overlapped with each other, therefore, the APEs were conflated into six non-contiguous clusters identified as APE-A through APE-F. Figure 3.6 shows the six APEs surveyed. The area of these APEs collectively totals approximately 7.57 acres of the larger 16.8-acre project area. A summary of the various APE areas is presented below.

1. APE-A (2.15 acres). This area is located at the southern end of the project area. The eastern portion of the APE is steeply sloped, while the central and western portion is flat. The sloped eastern portion likely represents the natural slope and shoreline edge of the peninsula prior to a large scale filling event between 1941 and 1945, while the central and western portion is a product of the filling event based upon historic aerial imagery of the peninsula, the USDA soil maps, and geo-referenced 1930s-era tax maps.
2. APE-B (0.33 acres). This area is located on a hillside north of the paved road accessing three pre-existing cottages (Facilities 1602, 1605, and 1606).
3. APE-C (2.45 acres). Located in the central portion of the project area, it includes moderately sloped areas as well as a relatively flat plateau overlooking Kaneohe Bay. The area has been disturbed due to the construction of a cottage access road through the central portion and bunkers in the southwest and northeast corners.
4. APE-D (1.36 acres). This is the most disturbed area within the project area. Most of the APE is paved, fenced, and includes a substantial industrial structure (Building 1180). In addition, the eastern portion of the APE likely includes numerous subsurface utilities.
5. APE-E (0.66 acres). This APE is located by a WWII-era small arms magazine storage facility (Facility 703) and non-paved cottage access roads bisect the area.
6. APE-F (0.62 acres). This area is located at the northern end of the project area, and three existing cottages (Facilities 1601, 1602, and 1614) are present.



Area of Potential Effect (APE) from Archaeological Inventory Survey

Figure 3.6

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

3.13.1.3 Architectural Resources

During World War II, several small arms magazines and inert storehouses were constructed along the Pali Kilo coastline. A group of seven small arms magazines were all constructed in 1941, and five of the previously documented World War II-era historic sites are within the project area (Facilities 702, 703, 704, 715, and 1231). Facility 703 is situated along Mokapu Road about 300 feet north of the Building 1180 site. Facility 702 is also situated along Mokapu Road about 600 feet further north of Facility 703. These two magazines (Facilities 702 and 703) were previously evaluated in a historic building inventory report by the MCB Hawaii, and are not further addressed.

Facility 704 is located within the modified APE for the reduced cottages, and this magazine consists of a concrete barrel vault design measuring 16 by 40 feet that has been covered with an earthen berm. A wide driveway with concrete walls on three sides extends to the entrance of the vault (Facility 704). Facilities 715 and 1231 are two inert storehouses that were both constructed in 1941. Facility 715 consists of an underground bunker with a walkway entrance. Facility 1231 has a concrete stair leading down to a metal door that opens into an underground bunker.

For purposes of NHPA compliance, the small arms magazines and inert storehouses are covered under the Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities. MCB Hawaii has already met their Section 106 requirements and obligations for undertakings affecting World War II and Cold War Era ammunition storage facilities. The small arms magazines and inert storehouses will be left in-place and not modified during this project. No additional historic buildings are present within the project area.

Facility 1180 and Relocation Site

The project also includes demolition of Facility 1180 which is an operations building constructed in 1959, but is currently used for the storage of emergency generators and other portable equipment. This building was determined not eligible for listing in the NRHP since it is not distinctive and does not have any Cold War significance. This determination by MCB Hawaii was documented in an October 22, 2015 letter sent to the State Historic Preservation Officer (Appendix D).

The area proposed for a new building to house the equipment from Building 1180 is located across from Facility 242 (refer to Figure 3.7). No archaeological sites or deposits have been identified in this area from previous archaeological work. This area is located across D Street from Facility 242 (Facilities Building), which has been determined not eligible for listing on the NRHP due to loss of integrity (MCB Hawaii letter in Appendix D).

This proposed location is also situated behind Facility 201 which is a former Utilities Shop and Parachute Loft-Storage building constructed in 1941 that has been determined to be eligible for listing in the NRHP. The principle view of this structure is from its front (southern side) along First Street, while the rear of the building faces a parking lot. Therefore, planned construction of the new building for equipment relocation on this rear (north) side is preferable and will distract less from the building's overall historic setting.



Figure 3.7

Historic Buildings Near Building 1180 Relocation Site

MCB Hawaii Kaneohe Bay
Pali Kilo Beach Cottages Expansion Project

3.13.1.4 Results of Archaeological Fieldwork

Field work conducted under the archaeological inventory survey by PCSI recorded six previously unknown archaeological sites and seven previously documented historic properties that are identified in Table 3.8.

Table 3.8. Summary of Previously Recorded and Unrecorded Historic Properties Identified within the Area of Potential Effect		
SIHP Number	Description	Recommendation
Previously Unrecorded Historic and Archaeological Resources		
-7722	Subsurface Pre-Contact Cultural Deposit	Eligible for NRHP, Criteria C, D; Contributes to the Mokapu House Lots Archaeological District at Pali Kilo; additional testing to west and north to determine extent
-7723	Burial	Addressed under NAGPRA
-7724	Disturbed Subsurface Cultural Deposit (Including One Human Tooth)	Eligible for NRHP, Criteria C, D; Contributes to the Mokapu House Lots Archaeological District at Pali Kilo
-7725	Historic Retaining Wall/Terrace	Eligible for NRHP, Criteria C, D; Contributes to the Mokapu House Lots Archaeological District at Pali Kilo
-7726	Military-Era Concrete Foundations	Recommended not eligible for NRHP; loss of integrity of its original function
Temporary Site T-6	Disturbed/Mixed Subsurface Cultural Deposit	Incorporate into Site 5733; Eligible for NRHP, Criteria C, D; Contributes to the Mokapu House Lots Archaeological District at Pali Kilo
Previously Recorded Historic Properties		
Facility 703	WWII Small Arms Magazine	Determined eligible for nomination to NRHP
Facility 704	WWII Small Arms Magazine	Determined eligible for nomination to NRHP
Facility 715	WWII Small Arms Magazine	Determined eligible for nomination to NRHP
Facility 1231	WWII Small Arms Magazine	Determined eligible for nomination to NRHP
-4610	Historic Residence	Expand site boundary; NRHP recommendation as previously determined
-5733	Pre/post-Contact Subsurface Site (Site T-6)	Expand site boundary; NRHP recommendation as previously determined
-2883	Pre/post-Contact Subsurface Site	Expand site boundary; NRHP recommendation as previously determined

Site 7722. This site is located near the western boundary of APE-C and likely extends beyond the APE to the north along a toe ridge towards the coast. Site 7722 is a disturbed traditional (Hawaiian) cultural deposit below approximately 40 centimeters (cm) of fill along a north-south toe of the ridge. The site may extend along the ridge to the north towards the shoreline, but has likely been disturbed in the area around two existing cottages (Facilities 1608 and 1609) outside the APE. Although the deposit within the APE appears to be disturbed, Site 7722 is recommended as potentially eligible for inclusion on the NRHP under Criteria C and D, and as a contributing property of the Mokapu House Lots Archaeological

District at Pali Kilo. Proposed Cottage 6 is currently located in this area, and its construction would affect the disturbed historic deposit.

Site 7723. This site included a partially intact human burial below the surface located near the northern boundary of APE-C. The footprints of Cottages 8 and 17 are located in the general area south of this site. The burial was recovered through controlled excavation based upon consultation with Native Hawaiian organizations affiliated with the Mokapu Peninsula in accordance with NAGPRA. Site 7723 is recommended as potentially eligible for inclusion on the NRHP under Criteria C and D, and as a contributing property of the Mokapu House Lots Archaeological District at Pali Kilo.

Site 7724. This site is located within APE-D and consists of a mixed subsurface cultural deposit that includes both traditional Hawaiian and historic artifacts. Extensive ground disturbance is evident throughout APE-D as well as on the northern sloped area of APE-C. A single tooth was recovered from Site 7724 and may represent an evulsion event rather than an intentional burial. After consultation with Native Hawaiian organizations affiliated with the Mokapu Peninsula in accordance with NAGPRA, excavations resumed around the cultural item and no additional human skeletal remains were encountered.

It is recommended that Site 7724 be considered eligible for inclusion on the NRHP under Criteria C and D, and that additional research and subsurface excavation be undertaken. Likewise, Site 7724 contributes to the area and period of significance of the proposed Mokapu House Lots Archaeological District at Pali Kilo. The proposed EU Complex at the Building 1180 site is located in this area, and its construction would affect the disturbed historic deposit.

Site 7725. This is an above-ground historic basalt and mortar retaining wall and soil terrace located within APE-D. The architectural style of the retaining wall is consistent with other constructions in the Pali Kilo area and likely dates to the 1930s or 1940s. This site likely represents the remnants of a separate historic complex. Site 7725 is recommended as potentially eligible for inclusion on the NRHP under Criteria C and D, and as a contributing property of the Mokapu House Lots Archaeological District at Pali Kilo. The proposed EU Complex is located in this area, and its construction would affect the wall.

Site 7726. This consists of two concrete foundations within APE-A. The foundations date from the WWII-era or shortly after, and likely represents the remnants of a light industrial facility. The lack of structural components demonstrates that the site does not retain sufficient integrity to be considered significant under any NRHP criteria. The property also does not appear to contribute to the area or period of significance to be included in the proposed Mokapu House Lots Archaeological District at Pali Kilo. Cottages 19 and 20 are proposed in this area.

Temporary Site T-6 and Site 5733. This site in APE-E is a subsurface deposit with mixed subsurface cultural material that includes both traditional Hawaiian and historic artifacts indicating the likely presence of a contiguous occupation along this shoreline. The historic component of the site is likely too disturbed to provide much information. However, the boundary of Site 5733 has been expanded to include Site T-6 because this expanded boundary likely reflects the size and complexity of the pre-Contact occupation of the Pali Kilo coast. This site is eligible under NRHP Criteria C and D, and the

recorded deposit may contribute to the area and period of significance of the proposed Mokapu House Lots Archaeological District at Pali Kilo. Cottages 9, 10, and 13a are located within this area, and its construction would affect the disturbed historic deposit.

Site 2883. Survey and subsurface excavation within APE-F confirmed the existing boundary of this Site 2883. The sporadic, non-contiguous, recording of subsurface cultural deposits within the APE suggests that the APE boundaries may be on the margin of the site, and the more intact components of the site are to the west and south, outside of the APE. While subsurface excavation was conducted within the known boundaries of Site 2883, positive shovel tests in the northeast corner of the APE-F (Cottage 11 footprint) indicate that the site boundary in that area may extend beyond the current designation. It is recommended that the Site 2883 site boundary be expanded several meters to the north and include the area between the current boundary and the southern boundary of the access road leading to Facility 1614. The additional components of Site 2883 contribute to the significance of the historic property under Criteria C and D of the NRHP. Cottage 11 is planned in this area, and its construction would affect the cultural deposits present.

Site 4610. Additional components of Site 4610 (residential house lot) were recorded within APE-B situated east and south of other features originally recorded. Twelve (12) additional components recorded include a step and path complex connecting the previously recorded components to a substantial terrace/foundation upslope and inland from the shoreline. It is likely that additional features of Site 4610 exist to the north and east of the APE.

Site 4610 is likely to yield important information concerning life on Mokapu Peninsula between 1936 and 1941 with additional research and subsurface excavation. The additional components of Site 4610 contribute to the significance of the historic property under Criteria C and D of the NRHP. Newly recorded components contribute to the area and period of significance of the proposed Mokapu House Lots Archaeological District at Pali Kilo. Proposed Cottage 3 is currently located in this area, and its construction would affect some site features from this former house lot.

3.13.2 Potential Impacts

Action Alternatives. Construction of the improvements under the action alternatives would have an adverse effect on some historic sites based upon the archaeological inventory survey results. Five proposed cottages situated north of the EU Complex (Cottages 9, 10, 11, 12a, 12b, and 13a) are sited in areas directly affecting or would be constructed near historic sites 2883 and 5733. These historic sites consist of subsurface deposit with mixed subsurface cultural material that includes both traditional Hawaiian and historic artifacts.

Construction of proposed Cottage No. 6 under the action alternatives would impact Site 7722, which is a disturbed traditional (Hawaiian) cultural deposit. The northern half of proposed Cottage No. 3 (duplex) would also impact Site 4610, which consists of components of a residential house lot that is a component of the proposed Mokapu House Lots Archaeological District.

Construction of four studio units associated with the southern wing of the proposed EU Complex at the Building 1180 site (proposed action) would impact Site 7724. This historic site consists of mixed subsurface cultural deposit that includes both traditional Hawaiian and historic artifacts. Construction of EU Complex under the Pali Kilo Beach Alternative would impact Site 7726 which consists of foundation remnants of a light industrial facility from the World War II Era.

No potential impacts are anticipated at the site proposed for the relocation of equipment from Building 1180. . This area is approximately 10,000 square feet in size and located on a grassed area on D Street across (west) from Building 242 and behind (north) Building 201.

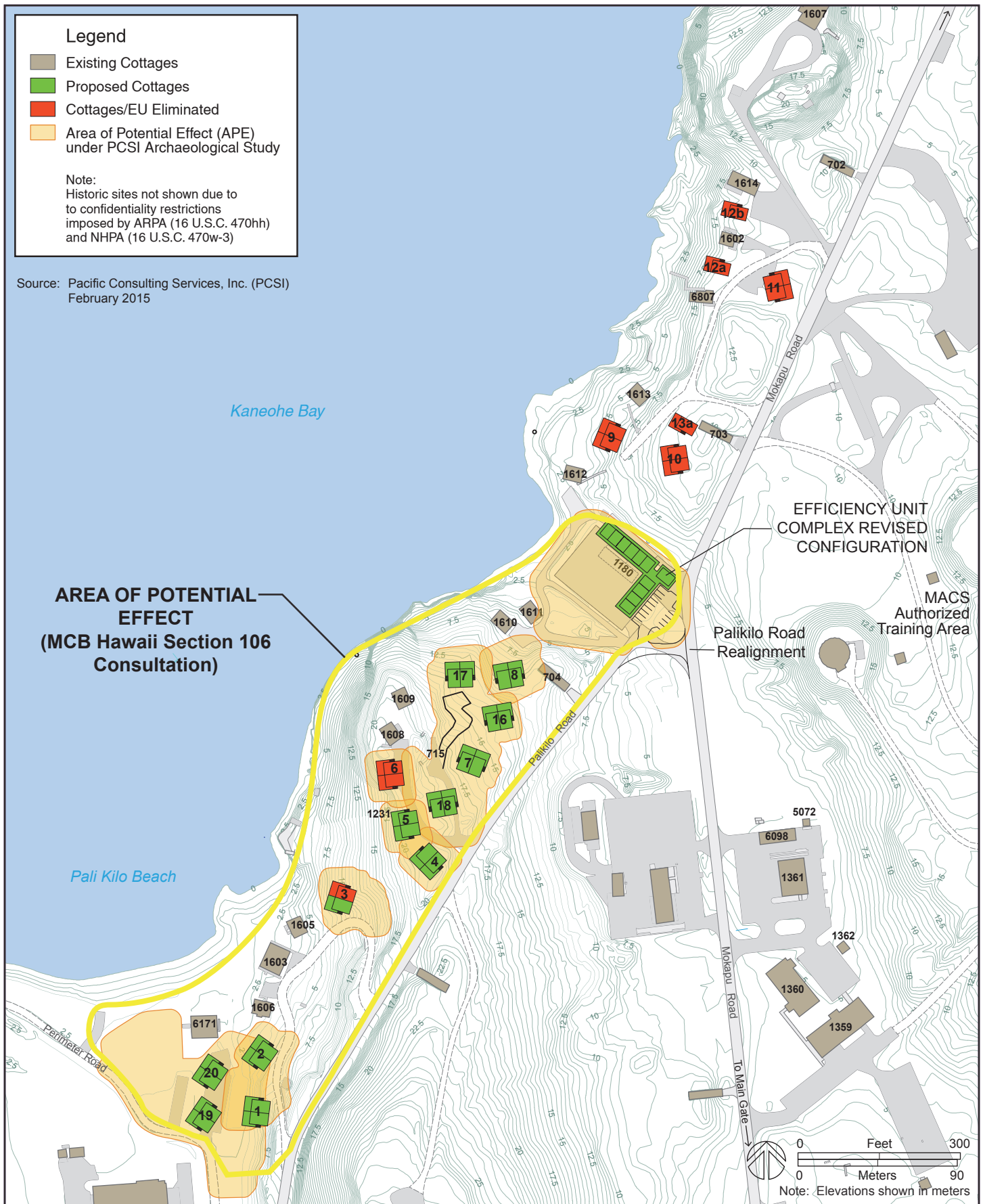
No Action Alternative. The No Action Alternative would not have short or long-term impacts on historic properties because present site conditions would continue with MCB operation of existing cottages.

3.13.3 Mitigation of Potentially Adverse Effects

Since several cottages along with a portion of the EU Complex (under proposed action) would result in an adverse effect on historic properties, MCB Hawaii has proposed reducing the number of cottages and EU Complex units to avoid impacting these historic properties as a means of mitigation. Consequently, only 12 cottage buildings (duplex or single) and a reduced 10-unit EU Complex will be constructed under this modification to the proposed action, and the EU Complex could also be re-configured into an L-shape building design instead of the current configuration. Figure 3.8 shows the reduced cottages and reconfigured EU Complex.

As shown on Figure 3.8, all of the cottages initially planned for the area north of the Building 1180 site would be eliminated. Cottage No. 6 on a bluff overlooking the coastline would be eliminated, and Cottage No. 3 would be changed from a duplex to only a single cottage now. The southern wing of the EU Complex under the original proposed action concept plan would also be eliminated (four units eliminated). A total of 33 units (duplex and single cottages and EU Complex) would now be implemented under this modification to the proposed action. This is a reduction of 16 units from the originally proposed 49 units under the proposed action. Furthermore, the Pali Kilo Beach Alternative would not be pursued, which will eliminate construction of the EU Complex at Pali Kilo Beach.

This modification to the proposed action was determined to have no adverse effect on historic properties because remaining cottages and the EU Complex would avoid the properties. Other mitigation, such as archaeological monitoring, would be implemented for these remaining cottages and EU Complex. This determination was based upon MCB Hawaii's Section 106 consultation efforts that are discussed in the following section.



Modifications to Proposed Action Under Section 106 Consultation

Figure 3.8

MCB Hawaii Kaneohe Bay
Pali Kilo Beach Cottages Expansion Project

3.13.4 Section 106 Consultation (NHPA)

Section 106 consultation was conducted by MCB Hawaii for this project under the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC §470). MCB Hawaii determined that reducing the number of cottages and units in the EU Complex under the proposed action conceptual plan (to avoid archaeological sites discovered during the inventory survey work) would result in the undertaking having “no adverse effect” on historic properties. The SHPO concurred with this “no adverse effect” determination in a November 9, 2015 response letter. Section 106 consultation correspondence is provided in Appendix D.

Modified Area of Potential Effect Under Section 106

The “Area of Potential Effect”, or APE, on historic properties established under MCB Hawaii’s Section 106 consultation was based upon the reduced number of cottages and EU (lodge) units as previously shown on Figure 3.8. This APE boundary differs from the area surveyed under the archaeological study in that it includes the entire Pali Kilo area between Palikilo Road and the shoreline, and from Perimeter Road south of Pali Kilo Beach and north to the Building 1180 site at the intersection of Palikilo Road with Mokapu Road. The APE also includes a 10,000 square foot area on D Street across (west) from Building 242 and behind (north) Building 201 due to the relocation of equipment from Building 1180 for the new Efficiency Unit complex. Figure 3.7 previously showed this relocation site and APE associated with it. The total APE for the areas proposed under MCB Hawaii’s Section 106 consultation is about 10.1 acres (Palikilo coastline and Building 1180 relocation site).

Determination of Effect

MCB Hawaii has determined, and the SHPO concurred, that the proposed undertaking with the reduced number of cottages and EU units (without south wing of complex), will result in no adverse effect to historic properties. This determination was based on the following:

1. The reduced number of proposed cottages are being sited to avoid impacting archaeological sites and deposits, and are relatively small and will be minimally visible from the east side of Pali Kilo Road, Mokapu Road, and from the ocean offshore;
2. The bunkers (Facilities 702, 703, 704, and 715) are covered under the Program Comment for World War II and Cold war Era (1939-1974) Ammunition Storage Facilities, and the Navy and MCB Hawaii have met their Section 106 requirements and obligations for undertakings affecting World War II and Cold War Era ammunition storage facilities;
3. The area proposed for relocation of Facility 1180 was previously disturbed, and no archaeological sites or deposits have been recorded in this area;
4. The proposed relocation site for Facility 1180 is on the rear parking lot side of Facility 201, and will be minimally visible from the principle (front) side of the building; and
5. Archaeological monitoring will be conducted in areas near archaeological sites or in areas with sand fill. If human remains are discovered, all work in the vicinity will stop and the remains will be stabilized and protected. Treatment will proceed under the authority of NAGPRA.

In its letter dated November 9, 2015 (Appendix D), the SHPO concurred with MCB Hawaii's determination that the proposed undertaking, with the reduced number of cottages and smaller EU Complex, will result in no adverse effects to historic properties.

3.14 Secondary and Cumulative Impacts

3.14.1 Secondary Effects

Secondary effects, also referred to as indirect effects, are effects caused by a project, but occur later in time or farther removed in distance than direct impacts but are still reasonably foreseeable. Such effects may include impacts on environmental resources or public facilities that occur from a project's influence on land use. Secondary impact assessments are concerned with impacts that are sufficiently "likely" to occur and not with the speculation of any impact that can be conceived of or imagined.

Action Alternatives. The action alternatives would not result in significant secondary effects on the physical or social environment in the project area. Construction of this project would generate short-term construction jobs that are anticipated to be filled by qualified local contractors on Oahu. This should not result in the permanent in-migration of workers to the island of Oahu to fill these construction jobs, and subsequently not contribute to secondary impacts. The few (less than 5) full-time operational jobs likely created by this action would also contribute to minimal, if any, secondary effects.

New cottages and the EU complex would result in additional guests staying within the Pali Kilo project area up to one week at a time. However, these recreational lodging accommodations would not increase the resident population living within MCB Hawaii Kaneohe Bay or on the island of Oahu because guests typically already reside on the island or within the State of Hawaii.

The action alternatives would not have significant secondary impacts on the resident population, land use patterns, recreational facilities, infrastructure, or the natural environment in the surrounding MCB Hawaii Kaneohe Bay area. Additional guests to the project area would not influence changes in the existing land use patterns of the surrounding area which consists of Pyramid Rock Beach, training areas, and operational facilities. MCB Hawaii's Master Plan land use plan would continue to govern the allocation of land use patterns in the area (NAVFAC Hawaii 2006).

No Action Alternative. The No Action Alternative would not cause secondary effects to the physical or social environment of the project area because present site conditions would continue with MCCS operation of existing cottages.

3.14.2 Cumulative Impacts

Cumulative impacts are typically defined as the effects on the environment that result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions within the study year. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over a period of time.

The Cottages at Kaneohe Bay, managed by MCCC, consist of 12 cottages (14 lodging units) that were constructed over time during the 1980's with the first building (Building 1602) completed in 1979. The most recent cottage is Building 6171 constructed along Pali Kilo Beach in 2002. Other recreational lodging buildings in the project area consist of the Presidential Cottage (Building 1607) operated by Base Operations, and Building 1614 managed by the U.S. Navy Seabees. Construction and operation of these lodging units do not appear to have caused significant impacts to the Pali Kilo project area as discussed in Chapter 3.

The estimation of future impacts from the action alternatives was based on reasonably foreseeable actions likely to occur or are probable rather than actions that are merely possible or subject to speculation. Analysis of cumulative impacts for the action alternatives was conducted on a qualitative basis, and the discussion of impacts presented in other sections of this document has provided information to assist in addressing the applicable cumulative effects.

Action Alternatives. Based upon the MCB Hawaii Master Plan, the only projects recommended for implementation in the general area are: 1) constructing a Pyramid Rock Beach pavilion and bathhouse; and 2) the proposed action of constructing additional cottages (NAVFAC Hawaii 2006). The action alternatives are part of a comprehensive planning framework for the Base that is designed to meet mission requirements (which includes MCCC-type services) in a balanced and deliberate manner that minimizes adverse cumulative impacts. Potential cumulative impacts associated with pertinent areas are discussed.

Construction Timing. If the beach pavilion and bathhouse are constructed concurrently with additional cottages or EU complex, some cumulative impacts associated with temporary construction activities could occur. This situation would contribute to increased short-term nuisance effects such as increased noise from activities and equipment, potential for runoff during large storms, and fugitive dust emissions. However, these nuisance effects would be temporary and should not generate a significant impact on the environment especially given the size of these improvements. Best management practices would also be implemented at construction sites to minimize short-term effects. Since MCCC would be responsible for both projects, they could appropriately sequence construction activities to minimize the overlapping of activities and subsequent effects.

Climate Change (Greenhouse Gas Emissions). The earth's climate is affected by energy entering and leaving its atmosphere, which can be affected by both natural and human factors, including variations in the sun's energy reaching the planet, changes in the reflectivity of its atmosphere and surface, and changes in the amount of heat retained by its atmosphere. When energy from the sun reaches the earth's surface, it can either be reflected back into space or absorbed by the earth. After it is absorbed, the energy can be released back into the atmosphere as heat (i.e., infrared radiation) (EPA June 28, 2012).

Greenhouse gas (GHG) emissions absorb energy, resulting in the slowing or prevention of heat loss back into space. The key GHGs emitted by human activities include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. In 2004, energy supply (i.e., the burning of coal, natural gas,

and oil for electricity and heat) was the largest source of global GHG emissions (26%), followed by industry (19%), land use change and forestry (17%), agriculture (14%), transportation (13%), commercial and residential buildings (8%), and waste/wastewater (3%) (EPA June 13, 2012).

Though individual projects are unlikely to have significant impacts on global climate change, they collectively may have cumulative effects when their individual GHG emissions are combined over time. The action alternatives would generate GHG emissions in the manufacturing, assembly, transportation and construction of additional cottage units. However, most of these GHG emissions would be temporary in nature. Operation of the additional cottages would generate additional gases primarily from vehicles, however, this increase should be relatively minimal in relation to overall GHG emissions and not have a significant impact.

Long-Term Effects. In the long-term, the action alternatives should not contribute to significant cumulative impacts on the physical or social environment. The pavilion and bathhouse would serve as an accessory use and amenity for people participating in outdoor recreational activities at Pyramid Rock Beach. That improvement would not generate new residents or visitors to the area, and should not result in environmental impacts that, considered together with the cottages and EU complex, cause significant cumulative impacts to the surrounding environment.

No Action Alternative. The No Action Alternative would not cause a significant cumulative impact to the physical or social environment in the project area because present site conditions would continue with MCCA operation of existing cottages.

3.15 Unavoidable Adverse Effects

As with any new development, the existing environment would be altered to a certain extent due to construction activities for proposed improvements even after implementation of pertinent minimization and best management practices measures. The various sections of this chapter have addressed pertinent environmental impacts associated with the action alternatives. Based upon these results, there are no adverse environmental impacts currently identified which cannot be mitigated.

There are also no unresolved issues associated with the action alternatives proposed. This chapter discusses the probable impacts associated with the alternatives and identifies minimization measures, and best management practices, as appropriate.

4.0 CONFORMANCE WITH FEDERAL LAND USE PLANS AND POLICIES

4.1 Coastal Zone Management (CZM) Act of 1972

Action Alternatives

The U.S. Congress noted in the CZM Act of 1972 (16 USC § 1451 et seq.) a national interest in the effective management, beneficial use, protection and development of the coastal zone. In Hawaii, the entire state falls within the coastal zone boundary with few exceptions. The CZM Act states that land subject solely to the discretion of the Federal government, such as federally owned or leased property is excluded from the State's coastal zone (i.e., MCB Hawaii Kaneohe Bay). However, Federal activities that directly affect the coastal zone are to be conducted in a manner consistent with the enforceable policies of federally approved State program to the extent practicable. The proponent of the action (MCB Hawaii) must determine whether the action would affect any coastal use or resource in a coastal state.

In 2009, the Navy and the Hawaii CZM Program updated a list of Navy/Marine Corps de minimis activities which are expected to have insignificant direct or indirect coastal effects and are not subject to further review by the Hawaii CZM Program. Construction of new cottages and the EU Complex fall within Items No. 1 and 2 on the De Minimis Activity List:

- Item No. 1: Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.
- Item No. 2: Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that uses rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.

The proposed demolition of existing Building 1180 under the proposed action falls under Item No. 11 of the De Minimis Activity List:

- Item No. 11: Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.

Relevant general conditions and other measures to minimize effects under the de minimis determinations for No. 1, 2 and 11 would be complied with and consist of the following.

- The number of cottages and EU Complex units would be reduced to avoid impacting historic properties. Consequently, only 12 cottage buildings (duplex or single) and a reduced 10-unit EU Complex will be constructed under the proposed action (total of 33 units).
- New construction and demolition activities would occur on Navy/Marine Corps property.

- Turbidity and siltation from project related work will be minimized and contained through use of effective BMP measures, and curtailment of work would occur during adverse tidal or weather conditions.
- No project-related materials will be stockpiled in the water.
- No contamination of adjacent marine environment will result from project-related activities.
- Fueling of project-related vehicles and equipment would take place away from the water, and a contingency plan will be developed to control the accidental spill of petroleum products.
- Any under-layer fills used will be protected from erosion with stones as soon after placement as practicable.
- Consultation pursuant to Section 106 of the NHPA has been completed (Section 106 Consultation Correspondence provided in Appendix D).
- The MCB Hawaii has determined that no species or habitats protected under the Endangered Species Act would be adversely affected by the action.
- The NEPA review process has been completed based upon this document.
- The MCB Hawaii has notified the State CZM of De Minimis Activity List applicability for this project.

An email dated April 27, 2016 was submitted to the State CZM office acknowledging MCB Hawaii's use of the De Minimis Activity List and the preparation of this Environmental Assessment. An email response was received from the State CZM office acknowledging receipt of this de minimis determination on April 28, 2016. This email documentation is included in Appendix E.

No Action Alternative. The No Action Alternative would not affect the State's CZM policies because the present site conditions would continue with MCCA operation of existing cottages.

4.2 MCB Hawaii Master Plan

Action Alternatives. MCB Hawaii's Master Plan designated the Pali Kilo project area as "Community Facilities" under the proposed land use map (NAVFAC Hawaii 2006). This area is presently used by MCCA for the operation of cottages, which is consistent with the designated land use for the area. Under the action alternatives, the additional cottage units and EU complex would be consistent with the land use designated for this area. These alternatives would also be consistent with Project MC-9 under the master plan that identified the construction of additional cottages via infill for this area.

No Action Alternative. The No Action Alternative would not change the present land use of the area, and the area would continue with MCCA operation of existing cottages. However, this alternative would not be consistent with the MCB Hawaii Master Plan's Project MC-9 that identified the construction of additional cottages for this area (NAVFAC Hawaii 2006).

4.3 MCB Hawaii Integrated Natural Resources Management Plan

The *Marine Corps Base Hawaii Integrated Natural Resources Management Plan* (INRMP) Update (MCBH 2011) guides implementation of MCB Hawaii's integrated natural resources management program on MCB Hawaii properties, and was prepared in accordance with the Sikes Act Improvement Act of 1997. It is an update of the original 2001 MCBH INRMP/EA (MCBH 2001) and follows an ecosystem management approach involving a suite of management actions within seven different Course of Action areas of concern representing a full array of natural resources and concerns. Pertinent objectives from this plan are addressed.

Goal 7.3: Watershed Management

Objective 7.3.3: Implement BMPs to improve watershed health.

Discussion: The project would be consistent with this objective because best management practices would be incorporated into the design of new cottages and the EU complex under the action alternatives. MCCC plans to include "green" elements in the design of parking areas, such as using grasscrete, to reduce paved areas and increase infiltration. MCCC plans to have the design for the new cottages and EU complex, along with associated improvements, comply with a minimum LEED Silver rating.

Goal 7.4: Coastal and Marine Resources Management

Objective 7.4.1: Improve inventory and conditions of biological and geophysical processes and features in MCB Hawaii littoral areas.

Discussion: A coastal marine study was conducted to document existing conditions of marine resources off the Pali Kilo coastline. This information supports this objective of inventorying biological conditions and helps address impacts from the action alternatives and necessary mitigation as discussed in this Chapter.

Objective 7.4.2: Identify and address impacts and threats to MCB Hawaii coastal and marine resources.

Discussion: Based upon the coastal marine study conducted, the EA addresses the impacts that may be associated with the action alternatives and identifies necessary minimization measures as discussed in this Chapter. This environmental review process thus supports this objective by identifying and addressing impacts to coastal marine resources.

Goal 7.5: Grounds Maintenance and Landscape Management

Objective 7.5.1: Take a sustainable landscape approach to improve grounds maintenance and landscape management.

- Ensure incorporation of not less than 50% native plants into new or renovated tree, shrub, and understory landscaping.

Discussion: MCCC conducts landscape maintenance within the Pali Kilo project area, and such maintenance work would continue under the action alternatives. MCCC would comply with the requirement of incorporating at least 50 percent native plants into landscaping

improvements by incorporated this into the design plans for additional cottages and EU complex. Regular landscape maintenance of increased areas due to the new buildings constructed would support re-establishing native vegetation within the project area. MCCA would coordinate with other MCB Hawaii Kaneohe Bay departments to ensure proper landscape maintenance procedures are implemented.

Goal 7.6: Quality of Life, Natural Resources-Based Outdoor Recreation, and Public Access

Objective 7.6.1: Provide opportunities for appropriate natural resources-related recreational/outreach activities within sustainable limits.

Discussion: The action alternatives would be consistent with this objective as additional cottages and the EU complex would increase access to the Pali Kilo project area, and allow guests to enjoy various forms of natural resources-related outdoor recreation (e.g., sun bathing, picnicking, relaxing on cottage decks, snorkeling, fishing, walking, etc.). Guests would also have the opportunity to conduct these and other recreational activities in surrounding areas such as surfing at Pyramid Rock Beach. These alternatives would support MCCA's mission to take care of Marine personnel and their families by providing additional recreational lodging in the area. The natural setting of the Pali Kilo area contributes to its appeal, and additional lodging units would support allowing a larger number of active duty and other DOD personnel to enjoy the area and time with family members. This EA process allows MCCA to evaluate the potential impacts so that mitigative measures can be incorporated into the design phase allowing for additional units implemented to be sensitive to existing resources.

Objective 7.6.2: Improve awareness of recreation uses, impacts, and constraints regarding MCB Hawaii natural resources.

- Display/distribute available presentation materials on outdoor recreation opportunities and constraints.

Discussion: The action alternatives would be consistent with this objective as MCCA provides cottage guests with material informing and educating them of the coastline area and natural resources present. MCCA would coordinate with other MCB Hawaii Kaneohe Bay departments to improve educational materials distributed to guests, along with improving effective management of this coastline area.

4.4 Unified Facilities Criteria; Installation Master Planning

The Unified Facilities Criteria (UFC) provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to MCB Hawaii Kaneohe Bay (USACE 2012).

Section 2-2.7: Sustainable Landscape Elements.

Planners would ensure that plans incorporate appropriate use of street trees, shrubs and ground cover. These landscape elements can control soil erosion, reduce the heat island effect, absorb storm water, improve air quality, provide comfortable places for recreation,

and support antiterrorism/force protection measures. In addition, trees improve the environment and provide shade, aesthetics, and security protection on an installation.

Discussion: The design phase implemented for the action alternatives would incorporate landscaping elements into the plans for construction. This includes complying with the requirement of incorporating at least 50 percent native plants into landscaping improvements.

Section 2-3.1: Land Preservation.

Land is a valuable natural resource to the DOD for installation sustainability and future viability. It is critical to training, sustaining, and deploying our forces. Installation master planners shall employ policies and plans that preserve land to the maximum extent possible. On many installations, land is a training resource and preservation of training capabilities is a national priority. All installations should include land preservation as a primary consideration in installation master planning since they may have training missions now or in the future.

Discussion: The action alternatives would be consistent with this objective concerning land preservation because it involves infilling additional cottages and the EU complex within the Pali Kilo project area that is already used for such activity (*The Cottages at Kaneohe Bay*), and is presently designated for continued use as part of the MCB Master Plan's land use plan. The number of additional cottages and EU Complex units proposed will also be reduced as a means of mitigating effects on historic sites which would also retain more areas as open space. Conservation measures would also be implemented based upon consultations with other federal agencies that would support and improve MCCS's management of these lands. The action alternatives preserve land in other areas of the base for other mission-related activities. This includes not encroaching into the inland area of Pyramid Rock Beach that is occasionally used for military training and exercises, and the area across (east) of the project area also used for training (MACS).

Section 2-3.2: Mission Compatibility.

Another important function of land preservation is to provide and maintain a buffer between the civilian community and key functions of a military installation, including range impact areas, airfields, and maneuver areas. Military land requirements are constantly changing, but it is becoming increasingly difficult to acquire new land to meet expanding requirements. Whether the goal is to preserve valuable range and training land, land for future installation development, or to conserve irreplaceable environmental habitat or cultural resources, land preservation would be a key objective of the Master Plan.

Discussion: The action alternatives would be consistent with this objective to maintain a buffer between the civilian community and key functions of a military installation. The location of additional cottages and the EU complex are sited outside of ESQD arcs and other operational hazards. Appropriate buffers around nearby training areas would be

maintained. Environmentally-aware guests (educated via the educational materials each guest receives from MCCC) will also help fulfil MCBH Hawaii Kaneohe Bay's stewardship responsibilities to conserve environmental habitat and cultural resources located within the project site.

4.5 MCB Hawaii Integrated Cultural Resources Management Plan

The *Update to the Integrated Cultural Resources Management Plan (ICRMP); Marine Corps Base Hawaii; 2014-2019* (NAVFAC PAC 2014) guides implementation of MCB Hawaii's integrated cultural resources management plan. This plan is an update of the 2006 *Integrated Cultural Resources Management Plan (ICRMP); Marine Corps Base Hawaii; 2006-2010* (USACE 2006). This serves as a multi-year plan supporting the military training mission by identifying compliance actions required by applicable federal laws and regulations concerning cultural resources management. It is an internal compliance and management plan that integrates cultural resources program requirements with ongoing mission activities and other planning documents and metrics. Pertinent objectives from this plan are addressed.

Objective: Resource Identification

Recommendation: Historic building inventories.

- Inventories are current to 2015; initiate inventory update for period 2015 to 2022.

Discussion: The archaeological inventory survey conducted for this project identified previously recorded historic sites within the project area. The action alternatives would not affect any existing historic building within the project area. Building 1180, proposed for use as the EU under the proposed action, was not identified as a historic building based upon the archaeological study and the inventory of historic buildings under this ICRMP.

Recommendation: Cultural/military landscape study.

- Evaluate and integrate historical, archaeological, and architectural data in context of landscapes; use as a context for evaluating military features and for sensitivity maps for military sites similar to archaeological sensitivity maps.

Discussion: The archaeological inventory survey conducted for this project incorporated pertinent data (e.g. prior studies, Mokapu House Lots Archaeological District) in evaluating effects on the cultural and military landscape. MCB Hawaii consultation with the SHPD also resulted in a modified proposed action that reduced the number of cottages to minimize effects on historic sites.

Recommendation: Traditional cultural properties study.

- Complete Section 110 identification requirements; review existing reports for information on potential TCPs; conduct additional archival and oral history research, as necessary; identify potential TCPs that can be evaluated through consultation.

Discussion: Section 110 identification requirements were conducted as part of an archaeological inventory study conducted. No TCPs were identified in the project area.

Recommendation: Archaeological site documentation.

- Make formal documentation and assign State site numbers to identified archaeological features or feature sets that do not yet have numbers; re-locate previously identified sites and take GPS readings for better integration into installation GIS.

Discussion: The archaeological inventory survey conducted for this project identified previously recorded and newly recorded historic sites within the project area. New sites were given State site numbers and recorded using GPS readings, and previously identified sites were re-located and their locations reconfirmed using GPS readings.

Objective: Resource Evaluation

Recommendation: NRHP significance evaluations for identified archaeological sites.

- Make significance evaluations and recommendations for NRHP eligibility for sites that have not yet been reviewed.

Discussion: The archaeological inventory survey made significance evaluations and recommendations for NRHP eligibility for sites recorded. These results were summarized in this document.

Recommendation: NRHP significance evaluation for identified potential TCPs.

- Initiate consultation to evaluate significance of sites identified in traditional cultural properties study.

Discussion: No TCPs were identified in the project area.

Recommendation: NRHP significance evaluation for military sites.

- Review existing reports for reference to military features; use military landscape study to assign State site numbers and evaluate significance.

Discussion: The archaeological inventory survey reviewed existing reports and documented information on existing military features within the project area. Newly identified military sites were assigned State site numbers and their significance was evaluated and documented.

Objective: Resource Management

Recommendation: Review of proposed projects for potential impact to cultural resources.

- Review sensitivity maps and comply with SOPs depending on level of sensitivity.

Discussion: The action alternatives were reviewed and evaluated for their effect on cultural resources under the archaeological inventory survey and Section 106 consultation efforts. MCB Hawaii consulted with the SHPD to address project effects using available data, maps and studies. SHPD concurred with a “no adverse effect” determination for this project based upon a modified proposed action that reduced the number of cottages to minimize effects on historic sites.

Objective: Public Education, Interpretation, and Outreach

Recommendation: Education and interpretive programs.

- Develop education and interpretive programs; work with MCCA to coordinate.

Discussion: The action alternatives would be consistent with this recommendation as MCCA would continue to develop and update educational programs and materials based upon new information developed from this project’s environmental review process.

5.0 PUBLIC AND AGENCY INVOLVEMENT, REVIEW, AND CONSULTATION

Federal Agencies

U.S. Department of Interior, Fish and Wildlife Services
U.S. National Oceanic Atmospheric Administration, National Marine Fisheries Service

State Agencies

Department of Business, Economic Development and Tourism (DBEDT)

- Office of Planning, Coastal Zone Management

Department of Land and Natural Resources (DLNR)

- State Historic Preservation Division

Office of Hawaiian Affairs

This page intentionally left blank.

6.0 REFERENCES

- American Society of Civil Engineers (ASCE). 2014. *Flood Resistant Design and Construction*. ASCE 24-14. Reston, Virginia.
- Brill, R.W., Balazs, G.H., Holland, K.N., Chang, R.K.C., Sullivan, S. and George, J.C., 1995. *Daily movements, habitat use, and submergence intervals of normal and tumor-bearing juvenile green turtles (Chelonia mydas L.) within a foraging area in the Hawaiian islands*. Journal of Experimental Marine Biology and Ecology, 185(2): 203-218.
- Board of Water Supply (BWS). 2002. *Water System Standards*. City and County of Honolulu. Honolulu, Hawaii.
- Carr, A.F., Hirth, H.F. and Ogren, L.H., 1966. The ecology and migrations of sea turtles. 6. The hawksbill turtle in the Caribbean Sea. American Museum Novitates, no. 2248. American Museum of Natural History, New York, 29 pp.
- Department of Business, Economic Development and Tourism (DBED&T). August 2012. *2011; The State of Hawaii Data Book; A Statistical Abstract*. State of Hawaii. Honolulu, Hawaii.
- Department of Business, Economic Development and Tourism. *List of SF1 Geographic Comparison Tables*. State of Hawaii. Honolulu, Hawaii. [http://census.hawaii.gov/census_2010] (accessed May 2015).
- Department of Health (DOH). August 2009. *State of Hawaii Annual Summary 2008 Air Quality Data*. Clean Air Branch, State of Hawaii. Honolulu, Hawaii.
- Department of Planning and Permitting (DPP). August 2000. *Koolaupoko Sustainable Communities Plan*. City and County of Honolulu. Honolulu, Hawaii.
- Department of Wastewater Management (DWM). July, 1993. *Design Standards of the Department of Wastewater Management; Volume I*. City and County of Honolulu. Honolulu, Hawaii.
- Drolet, Robert P., Patricia A. Drolet, and Allan J. Schilz. 1996. *Archaeological Inventory Survey of Pali Kilo and Ulupa'u Crater Parcels, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii*. Final report prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor by Ogden Environmental and Energy Services, Honolulu.
- Environmental Protection Agency (EPA). "Causes of Climate Change."
<http://www.epa.gov/climatechange/science/causes.html>. Updated June 28, 2012.
- Environmental Protection Agency. "Global Emissions."
<http://www.epa.gov/climatechange/ghgemissions/global.html>. Updated June 13, 2012.

- Federal Emergency Management Agency (FEMA). November, 2013. *Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects*. Department of Homeland Security. Washington, DC. Federal Emergency Management Agency (FEMA). November, 2013. *Guidance for Applying ASCE 24 Engineering Standards to HMA Flood Retrofitting and Reconstruction Projects*. Department of Homeland Security. Washington, DC.
- Federal Emergency Management Agency (FEMA). July 2015. *Highlights of ASCE 24-14 Flood Resistant Design and Construction*. Department of Homeland Security. Washington, DC.
<http://www.fema.gov/media-library/assess/documents/14983.html>. Publication Date: July 2015.
- Gosser, Dennis C., Richard Nees, Stephan D. Clark, and Sara L. Collins. 2015. *Archaeological Survey and Testing in Support of the Pali Kilo Beach Cottages Construction, Marine Corps Base, Hawaii, Kaneohe Bay, Oahu, Hawaii*. Final report prepared for the Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor by Pacific Consulting Services, Inc., Honolulu.
- HDR/Hawaii Pacific Engineers. September 2008. *Update Utility Systems Assessment for Wastewater System at MCBH Kaneohe Bay*. Final submitted prepared for the Department of the Navy, Naval Facilities Engineering Command, Hawaii. Honolulu.
- Institute of Transportation Engineers (ITE). 2003. *Trip Generation, 7th Edition*. Washington, D.C.
- Macdonald, Gordon A., Abbott, Agatin T., and Peterson, Frank L. 1983. *Volcanoes in the Sea, The Geology of Hawaii*. Second Edition. University of Hawaii Press. Honolulu, Hawaii.
- Marine Corps Base Hawaii (MCBH). November 2011. *Final Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (2012-2016)*. Prepared by MCB Environmental Compliance and Protection Department and Sustainable Resources Group International, Inc.
- Marine Corps Base Hawaii. November 2001. *MCB Hawaii Integrated Natural Resources Management Plan/Environmental Assessment (2002-2006)*. Prepared by Diane C. Drigot, Environmental Department, MCB Hawaii and Bruce A. Wilcox and Kristin N. Duin, Sustainable Resources Group International, Inc.
- Navy Facilities Engineering Command, Pacific Division (NAVFACPAC). January 2016. *Biological Evaluation for the Proposed Expansion of the Pali Kilo Cottages, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii*. Department of Environmental Planning, Marine Resources.
- Navy Facilities Engineering Command, Pacific Division (NAVFACPAC). April 2015. *Baseline Assessment of Marine Resources Near Pali Kilo Cottages, Marine Corps Base Hawaii*. Department of the Navy. Prepared for Pacific for Marine Corps Base Hawaii.
- Navy Facilities Engineering Command, Pacific Division. June 2014. *Update to the Integrated Cultural Resources Management Plan (ICRMP); Marine Corps Base Hawaii; Final*. Department of the Navy. Prepared by M.J. Tomonari-Tuggle; International Archaeological Research Institute, Inc.
- Navy Facilities Engineering Command, Pacific Division. July 2009. *Air Installations Compatible Use Zones (AICUZ) Study Update; Marine Corps Base Hawaii, Kaneohe Bay; Final Draft*. Department of the Navy. Prepared by Wil Chee Planning and Environmental and Horsch Planning and Engineering, PLC.

- Navy Facilities Engineering Command Hawaii (NAVFAC Hawaii). December 2006a. *MCB Hawaii Master Plan Volume I - Land Use Plan; Final*. Department of the Navy. Facilities Planning and Real Estate Department. Unpublished document.
- O'Day, Patrick M. 2007. *Archaeological Survey and Testing for the Pali Kilo II Historic Preservation Project, Marine Corps Base Hawaii Kaneohe Bay (MCBH-KB), Oahu Island, Hawaii (TMK: 4-4-08)*. Final report prepared for Social Research Pacific, Inc. by International Archaeological Research Institute, Inc. under contract to U.S. Army Engineering District, Honolulu.
- Pacific Consulting Services, Inc. (PCSI). February 2015. *Final Report; Archaeological Survey and Testing in Support of the Pali Kilo Beach Cottages Construction, Marine Corps Base, Hawaii, Kaneohe Bay, Oahu, Hawaii*. Prepared for Marine Corps Base Hawaii (unpublished). Honolulu, Hawaii.
- Parker, D.M., Balazs, G.H., King, C.S., Katahira, L. and Gilmartin, W., 2009. *Short-Range Movements of Hawksbill Turtles (Eretmochelys imbricata) from Nesting to Foraging Areas within the Hawaiian Islands*. Pacific Science, 63(3): 371-382.
- Tomonari-Tuggle, M.J., and Tom Arakaki. 2014. *Mokapu: A Paradise on the Peninsula: Stories From Not So Long Ago*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. International Archaeological Research Institute, Inc., Honolulu.
- Townscape, Inc. September 2012. *Koolau Poko Watershed Management Plan*. Prepared for Honolulu Board of Water Supply. Honolulu, Hawaii.
- U.S. Army Corps of Engineers (USACE). May 2012. *Unified Facilities Criteria (UFC); Installation Master Planning*. UFC 2-100-01.
- U.S. Army Corps of Engineers. November 2006. *Integrated Cultural Resources Management Plan (ICRMP); Marine Corps Base Hawaii; 2006-2010*. Prepared by USACE, Honolulu Engineer District and Wil Chee Planning and Environmental. Unpublished document.
- U.S. Department of Agriculture, Soil Conservation Service (SCS). August 1972. *The Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii*. In cooperation with the University of Hawaii, Agricultural Experiment Station. Washington, D.C.
- U.S. Department of the Interior, Geological Survey (USGS). January 2002. *Atlas of Natural Hazards in the Hawaiian Coastal Zone*. Prepared by Fletcher, Charles H., Grossman, Eric E., Richmond, Bruce M., and Gibbs, Ann E. in cooperation with University of Hawaii, State Office of Planning, and National Oceanic and Atmospheric Administration. Geologic Investigations, Series I-2761. U.S. Government Printing Office.
- U.S. Fish and Wildlife Service (USFWS). 2012. *Marine Corps Base Hawaii-Kaneohe Bay 2012 Benthic Community Mapping Draft Report*.
- Western Pacific Regional Fishery Management Council (WPRFMC). 2009. *Fishery Ecosystem Plan for the Hawaii Archipelago*. In: Western Pacific Regional Fishery Management Council (Editor), Honolulu, Hawaii, pp. 286 pages.

- Western Regional Climate Center (WRCC). 2010. National Oceanic and Atmospheric Administration, U.S. Department of Commerce. Historical Climate Information. Climate Data Summary. [<http://www.wrcc.dri.edu/index.html>] (accessed March 2013).
- Whittow, G.C. and Balazs, G.H. 1982. *Basking behavior of the Hawaiian green turtle (Chelonia mydas)*. Pacific Science, 36(2): 129-139.

7.0 LIST OF PREPARERS

Naval Facilities Engineering Command, Pacific

Alan Suwa (Naval Facilities Engineering Command, Pacific)

Masters of Urban and Regional Planning

Years of Experience: 36 years

Responsible for: NEPA EA Project Manager

Carly R. Antone (Naval Facilities Engineering Command, Pacific)

B.A., Anthropology

Years of Experience: 13

Responsible for: Cultural Resources

Jackie Sanehira, AIA (Naval Facilities Engineering Command, Pacific)

B.A., Architecture

Years of Experience: 33

Responsible for: Cultural Resources

Ian Lundgren, Marine Resource Specialist (Naval Facilities Engineering Command, Pacific)

M.A., Marine and Environmental Science

Years of Experience: 14

Responsible for: Marine Resources

Justin Fujimoto, Fish and Wildlife Biologist (Naval Facilities Engineering Command, Pacific)

B.S. Natural Resources and Environmental Management

Years of Experience: 6

Responsible for: Terrestrial Biology

Shirley Matoi, P.E. (Naval Facilities Engineering Command, Pacific)

M.S. Coastal Engineering; B.S. Civil Engineering

Years of Experience: 34 years

Responsible for: Project Design /Description

A-E Contractor: Helber Hastert & Fee, Planners, Inc.

Thomas A. Fee, AICP, LEED AP ND, Principal-in-Charge

M.A., Urban and Regional Planning, University of Hawaii at Mānoa

B.A., Economics, University of Hawaii at Mānoa

Years of Experience: 30 years

Ronald A. Sato, AICP, Primary Author

M.A., Urban and Regional Planning, University of Hawaii at Mānoa

B.S., Political Science, University of Hawaii at Mānoa

Years of Experience: 26 years

Marine Corps Base Hawaii Review

Ron Yamada, NEPA Program Manager

Earl Correa, MCCS

Karen Balabis, Spill Response Coordinator/Solid Waste Program Manager

Lance Bookless, Senior Natural Resources Manager

June Cleghorn, Senior Cultural Resources Manager

Steve Forjohn, MCB Hawaii Counsel

Mia Ng, MCCS

APPENDICES



Appendix A

Photos of Project Site and Surrounding Area





Photo 1A: View of Mt. Ka'ala Access Road



Photo 1B: View of Mt. Ka'ala AFS entrance



Photo 1C: East view of bog area located south of installation



Photo 1D: East view of State radio facility and downhill antenna site

Photos of Existing Site Conditions

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project



Photo 2A: South View of South Beach Site for Efficiency Unit



Photo 2B: Northeast View of Building 1180 Site for Efficiency Unit



Photo 2C: Northwest View of Cottages at North End of Area



Photo 2D: Northeast View of Palikilo Coastline Area from Knoll

Photos of Existing Site Conditions

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project



Photo 3A: Northeast View of Palikilo Road



Photo 3B: Southwest View of Knoll Along Coastline



Photo 3C: Southwest View of Palikilo Coastline Area



Photo 3D: Northeast View of Palikilo Coastline Area

Photos of Existing Site Conditions

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project



Photo 4A: Southwest View of Mokapu Road



Photo 4B: Northeast View of Mokapu Road



Photo 4C: Northeast View of Pyramid Rock Area

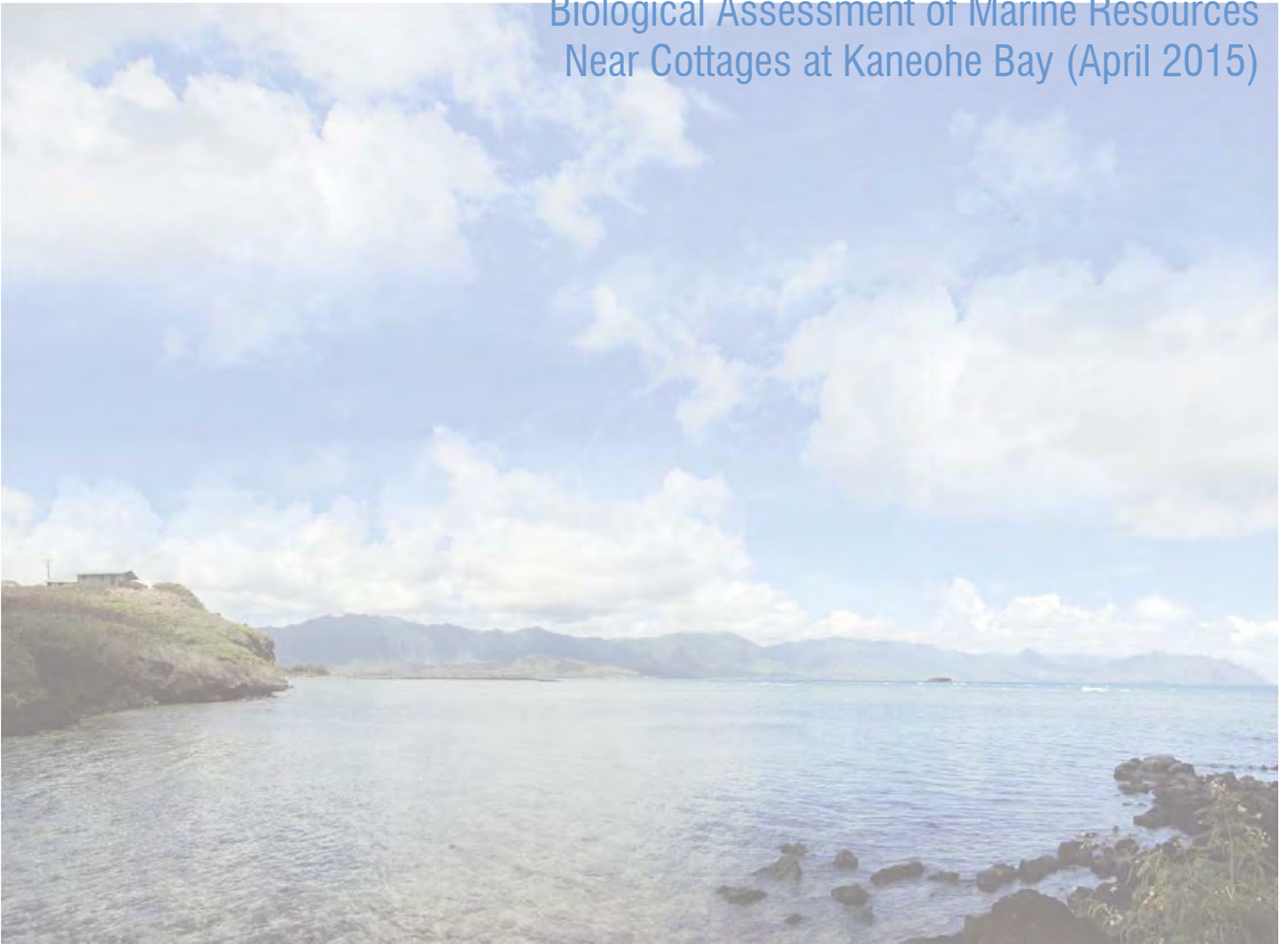


Photo 4D: East View of Pyramid Rock Beach

Photos of Existing Site Conditions

MCB Hawaii Kaneohe Bay
Pali Kilo Cottages Expansion Project

Appendix B
Biological Evaluation for Proposed Expansion of the
Pali Kilo Cottages (January 2016) &
Biological Assessment of Marine Resources
Near Cottages at Kaneohe Bay (April 2015)



Biological Evaluation for the Proposed Expansion of the Pali Kilo Cottages, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii



Prepared by:
Naval Facilities Engineering Command, Pacific
Department of Environmental Planning, Marine Resources
258 Makalapa Dr., Suite 100
Pearl Harbor, HI 96860-3134

January 17, 2016



TABLE OF CONTENTS

1.0	BACKGROUND / HISTORY	1
1.1	PURPOSE.....	1
1.2	EARLY COORDINATION AND PRE-CONSULTATION	1
2.0	DESCRIPTION OF THE ACTION AND ACTION AREA	1
2.1	PROJECT DESCRIPTION	1
2.1.1	<i>Proposed Construction Footprint</i>	2
2.1.2	<i>Nearshore Marine Resources</i>	3
3.0	BIOLOGICAL EVALUATION OF IMPACTS TO ENDANGERED SPECIES	4
3.1	ESA-LISTED SPECIES IN THE ACTION AREA	4
3.1.1	<i>Green Sea Turtle</i>	5
3.1.2	<i>Hawksbill Sea Turtle</i>	6
3.1.3	<i>Hawaiian Monk Seal</i>	7
3.2	CRITICAL HABITAT IN THE ACTION AREA	8
4.0	EFFECTS OF THE ACTION ON ESA-LISTED SPECIES	8
4.1	DISTURBANCE FROM HUMAN PRESENCE	9
4.1.1	<i>Construction Area</i>	9
4.1.2	<i>Marine Area</i>	10
4.2	EXPOSURE TO ELEVATED NOISE LEVELS DURING CONSTRUCTION	10
4.3	EXPOSURE TO SEDIMENTATION, WASTES, AND DISCHARGES	11
4.4	ESA CONCLUSION.....	11
5.0	ESSENTIAL FISH HABITAT ASSESSMENT	12
5.1	ENVIRONMENTAL BASELINE CONDITIONS	12
5.2	CURRENT IMPACTS.....	13
5.3	EFH AND FEDERALLY MANAGED FISH SPECIES.....	14
5.4	FISHES AND HABITAT IN THE PROJECT AREA	15
5.5	ASSESSMENT OF POTENTIAL IMPACTS TO ESSENTIAL FISH HABITAT	17
5.6	EFH CONCLUSION	19
6.0	BEST MANAGEMENT PRACTICES (BMPS)	20
7.0	CONSERVATION MEASURES	20
8.0	REFERENCES	20
9.0	APPENDICES	24
9.1	APPENDIX A: LIST OF ESA-PROTECTED SPECIES FOR HAWAII (NMFS 2015)	24

1.0 BACKGROUND / HISTORY

1.1 Purpose

The purpose of this combined Biological Evaluation (BE) and Essential Fish Habitat Assessment (EFHA) is to address the effect of the Pali Kilo Beach Cottages Expansion Project (the Project) on (1) species listed as endangered or threatened under the Endangered Species Act of 1973, as amended (ESA), and their designated critical habitat, and (2) designated Essential Fish Habitat (EFH) in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

The purpose of the proposed action is to increase the number of recreational beach cottages at Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii in order to accommodate additional guests, meet the existing and future needs of guests, and promote the overall morale and welfare of the U.S. Marine Corps and larger U.S. Department of Defense (DOD) community. The Project may result in increased recreational use of habitat where ESA-listed species occur, including green sea turtles (*Chelonia mydas*), hawksbill turtles (*Eretmochelys imbricata*), and Hawaiian monk seals (*Monachus schauinslandii*). Additionally, the Project may result in increased recreational use of EFH.

1.2 Early coordination and pre-consultation

Early coordination and pre-consultation with the National Oceanographic and Atmospheric Administration, National Marine Fisheries Service (NOAA-NMFS) was conducted during a series of meetings, presentations, and email/mail communications in 2012. Survey design of baseline marine resources along the Project site was shared with NOAA-NMFS prior to conducting the surveys, and the draft report from those surveys was shared. USFWS Aquatic Ecosystems Conservation Program was also made aware of this project.

This BE/EFHA addresses the proposed action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, for species under the jurisdiction of the National Marine Fisheries Service (NMFS). Section 7 of the ESA assures that, through consultation (or conferencing for proposed species) with NMFS and/or the U.S. Fish and Wildlife Service (USFWS), federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species, or result in the destruction or adverse modification of critical habitat.

2.0 DESCRIPTION OF THE ACTION AND ACTION AREA

2.1 Project Description

Marine Corps Community Services (MCCS) presently operates the 14-unit Pali Kilo Cottages situated along a coastal reach referred to as Pali Kilo within MCB Hawaii Kaneohe Bay. This is located on the western edge of Mokapu Peninsula in the He'eia ahupua'a within the Ko'olaupoko District of Oahu. This coastal area is bordered by Pali Kilo Road to the east, and the shoreline of Kane'ohe Bay to the west that extends northward to the geological feature known

as Kuau or Pyramid Rock.

This proposed action consists of constructing additional recreational lodging units along the Pali Kilo area of the Mokapu Peninsula at MCB Hawaii Kaneohe Bay, where the 14 existing cottage buildings are currently sparsely distributed.

Figure 1. Terrestrial Action Area



2.1.1 Proposed Construction Footprint

The construction area for the proposed action generally includes the area from the shoreline inland to Pali Kilo Road and Mokapu Road, and from [REDACTED] (near south beach cove) north up to Building 1607 (Presidential Cottage). This construction area encompasses about 16.8 terrestrial acres (Figure 1). This area can be described as being somewhat rural in character with a predominantly rocky coastline. The shoreline also has a few small pocket beaches, as well as a small cove to the south (south beach cove) at the southern extent.

The proposed action consists of constructing up to 19 new recreational cottages along the Pali Kilo area of the Mokapu Peninsula at MCB Hawaii, Kaneohe Bay (supplementing the existing 14 cottages). More specifically, there will be a total of 35 units in these 19 separate single or duplex cottages and 14 studio units together in a single "Efficiency Unit" (EU) complex. The EU will be located at the site of Building 1180 (currently storage for portable equipment). Building 1180 would subsequently be demolished, and its equipment relocated to a new building constructed at a location in the southern area of the base based upon coordination within MCB Hawaii Kaneohe Bay. A 10,000 square foot, open lawn area along D Street across from Building 242 has been selected as this relocation site. Site 1180 EU Option is depicted in Figure 2.

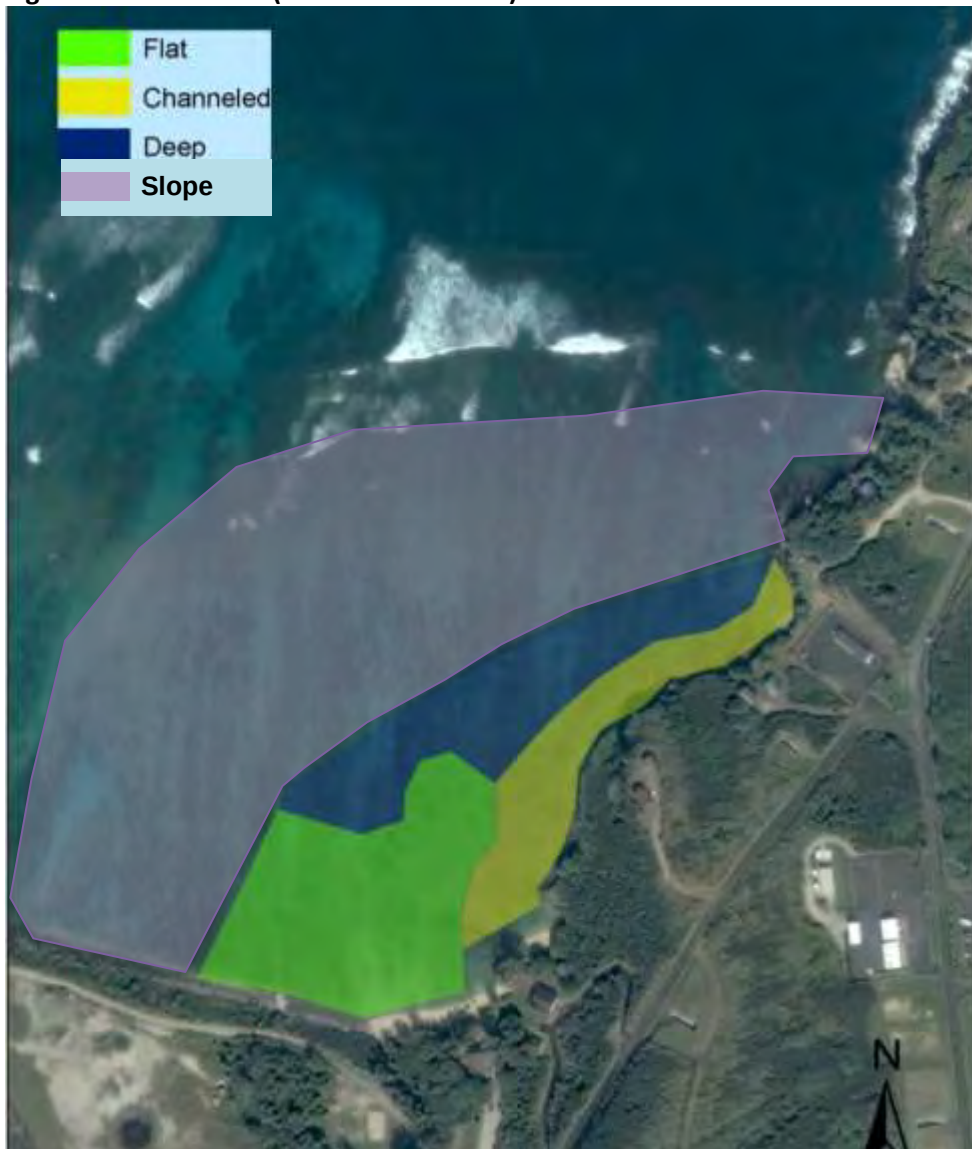
Figure 2. Proposed EU location for proposed alternatives



2.1.2 Nearshore Marine Resources

Included in the Action Area are the nearshore marine resources along the Pali Kilo Shoreline where proposed construction would occur. It is expected that BMPs (listed in Section 6) will entirely mitigate impacts from construction. However, it is possible that additional lodging may increase recreational use of the nearshore marine environment once the units are operational, with associated indirect impacts. Therefore, a portion of marine habitat has been included in the action area (Figure 3). It is expected that conservation measures (listed in Section 7) will minimize longterm impacts from recreational activities.

The marine action area forms an arc stretching from the second northernmost existing cottage (21.459909, -157.765857), to the eastern edge of the runway and Perimeter Rd. (21.456747, -157.771122), roughly 35 acres. The habitat in the marine action area is a typical fringing reef structure with a shallow limestone reef flat that gradually becomes deeper, and then slopes more dramatically. Three relatively distinct reef flat areas (strata) are apparent: a shallow reef flat, a shallow reef flat with channels, and a deeper reef flat (Figure 3, NAVFAC 2015). Past this area, the reef flat begins to slope downward to increasing depths. The extent of the area of consideration is the reef flat areas and slope down to approximately 15 feet.

Figure 3. Marine area (with habitat strata) included in the action area

3.0 BIOLOGICAL EVALUATION OF IMPACTS TO ENDANGERED SPECIES

3.1 ESA-Listed Species in the Action Area

The full list of protected species that occur in Hawaiian waters and those currently proposed can be found in Appendix A. Many protected species in Hawaiian water have life history or habitat requirements that preclude impacts from the proposed action. The following ESA-listed marine species may be in or near the action area and therefore could potentially be exposed to adverse impacts by the proposed action:

- Green sea turtle (*Chelonia mydas*) – threatened
- Hawksbill sea turtle (*Eretmochelys imbricata*) – endangered
- Hawaiian monk seal (*Monachus schauinslandi*) – endangered

The MCBH Integrated Natural Resource Management Plan (INRMP) identifies multiple conservation measures that may confer benefits to all three protected species within the action area and/or their habitat (Sustainable Resources Group Intn'l, Inc., 2011). Beneficial actions include: debris removal, prohibitions against lay nets and gill nets in the 500-yard buffer zone surrounding MCBH, restrictions on fishing, enforcement of established rules by a Conservation Law Enforcement Officer, interagency cooperation for rehabilitation events, use of established procedures for haul-outs, educational outreach for protected species (including classroom briefs, Web page, news articles, brochures, service projects, and on-site signage and monitoring), protected species scouting surveys prior to training exercises along the beach; invasive species removal (*e.g.*, removing invasive mangroves to support native species habitat), ecological assessments in marine resources surveys and inventories, and water quality projects (minimizing erosion and pollution).

Additionally, protocols for handling and reporting for Hawaiian monk seal haul out events have been improved (*e.g.*, updated signage created for posting at haul out locations, reporting procedures improved and more widely distributed). Seal protection zones are established and signage is posted around seals that have hauled out in order to limit human-seal interactions. All monk seal sightings at MCBH properties are recorded in an in-house database and shared with NOAA upon request.

3.1.1 Green Sea Turtle

Green sea turtles are circumtropical, found around the globe in the tropical and sub-tropical latitudes (approximately between 30° N and 30° S latitude). In 1978, green sea turtles were protected under the Endangered Species Act (USFWS, 1978, 2001). In most U.S. jurisdictions, green sea turtles were listed as threatened, except in Florida (and Pacific Mexico), where breeding populations were listed as endangered. In 2015, there was a petition re-classify green sea turtles found in Hawaii as a distinct population segment (DPS) and to de-list them from ESA protection. Although NMFS determined that Hawaiian green sea turtles did constitute a DPS, they did not find justification to de-list them, and will remain listed as threatened. Although populations globally are declining (Seminoff, 2004), the Hawaiian DPS is closer to recovery than anywhere throughout its range (Balazs and Chaloupka 2004a, Chaloupka and Balazs 2007). Another unique feature of the Hawaiian Green sea turtle DPS is that they haul-out onto shorelines to bask (passively increasing body temperature).

The recognition that Hawaiian green sea turtles are a DPS is supported by a number of findings that have implications for conservation and management. The typical life cycle for sea turtles includes a prolonged pelagic juvenile phase, nearshore recruitment to forage areas where they grow and mature, and an adult phase marked by long reproductive migrations to natal beaches, often crossing multiple international jurisdictions. However, in Hawaii, most greens that forage in the Hawaiian Archipelago also nest within the Archipelago at French Frigate Shoals (Balazs et al., 1994), and otherwise forage with strong island fidelity (Balazs, 1976, 1980, 1983; Dutton et al., 2008).

At MCBH, some green turtles have been documented recently near Pali Kilo swimming and resting (Cox et al. 2013), and are anecdotally observed frequently in MCBH waters. Infrequent green sea turtle haul-outs have been observed along the coastline of the MCBH

shoreline, and are frequently observed in the vicinity of Pali Kilo (pers. comm. L. Bookless, J. Moribe, and A. Richards-Dona). No green turtle nesting has been documented in the action area.

Major threats to green sea turtles worldwide are the loss of nesting and foraging habitat, harvest for food, and harvest as bycatch. While understanding how harvest impacts a long-lived and slow to mature species can be easily understood, loss of habitat is more complicated. Nesting habitat may be lost or degraded through erosion control measures (armoring and beach nourishment), and by invasions of non-native vegetation that can restrict access. Additionally, artificial lighting on the coastline may act as a deterrent to nesting females and could lethally disorient hatchlings. Foraging habitat can be degraded through impaired water quality (sedimentation and/or pollution via stormwater runoff), or by direct impact to the physical structure (breakage of limestone features that provide refugia) and biological features (change in community structure effecting food source availability).

3.1.2 Hawksbill Sea Turtle

Hawksbill sea turtles, like green sea turtles, are circumtropical, and found around the globe in the tropical and sub-tropical latitudes (approximately between 30° N and 30° S latitude). In 1970, hawksbill sea turtles were protected under the Endangered Species Act (NMFS and USFWS, 1998). Hawksbill sea turtles are listed as endangered throughout its range. In the Pacific hawksbills are rare and nesting is scattered, occurring mostly in locations near Australia and the Indian Ocean. In the main Hawaiian Islands, limited hawksbill sea turtle nesting occurs on Hawaii Island, and to an even lesser extent, on Oahu, Molokai, and Maui. Hawksbills do forage in the Hawaiian Islands, but are observed much less frequently than green sea turtles. Population trends are difficult to determine for hawksbill sea turtles due to lack of information. Despite positive short term trends in some locations, it is believed that populations in Hawaii and overall continue to decline (NMFS and USFWS, 2013). Hawksbill turtles face the same threats as green sea turtles, but are also vulnerable due to the commercial value of their shells for trade (Mortimer and Donnelly 1999).

Hawksbill sea turtles have a very similar lifecycle to green sea turtles, hatching at natal beaches, followed by early development in the open ocean, and recruitment as sub-adults onto coastal habitats. However, instead of eating primarily seagrass and algae, hawksbill sea turtles eat primarily sponges, and to a lesser extent other invertebrates coral, and algae. King (2011) reported hawksbill sea turtles in Hawaii having a highly variable diet, including: octopus, algae, fire worms, black sponges, fish roe, and urchins. Once reproductively active, adults make long migrations to natal areas to mate and nest.

Although long migrations are common, Hawksbills in Hawaii are more likely to nest and forage within the archipelago. Both genetic testing (Dutton and Leroux, 2008), and satellite tracking (Parker et al., 2009) indicate Hawaiian hawksbills are isolated from other Pacific populations. The extent of nesting in the Northwest Hawaiian Islands (NWHI) is uncertain, but they are known to nest within the Main Hawaiian Islands (MHI). Within the MHI, the vast majority (>90%) of hawksbill nesting occurs on the south and southeast coasts (Kau Coast) of Hawaii Island. Maui and Molokai also have regular nesting, whereas, nesting on Oahu is occasional. Satellite tracking has shown that the northeast coast of Hawaii Island (Hamakua Coast) is commonly used for foraging.

Although present, hawksbill sea turtles are not commonly observed within the action area. Hawksbills utilize the marine habitat for foraging and resting and are infrequently observed near MCBH. No hawksbill sea turtles have been recently documented nesting at MCBH.

Hawksbill sea turtles are threatened primarily by habitat loss, both nesting and foraging, as described for green sea turtles. Impacts to hawksbill habitat are occurring globally (Mortimer and Donnelly, 2008), and include: coastal development and erosion control, artificial lighting, invasive vegetation, and impaired water quality (NMFS and USFWS, 2013). Some bycatch does occur to a lesser extent than for green sea turtles, but direct harvest of eggs and adults for their shells are leading threats.

3.1.3 Hawaiian Monk Seal

The Hawaiian monk seal normally ranges throughout the Hawaiian archipelago, especially the NWHI where main breeding areas are located, but are sometimes observed as far away as Johnson Atoll, Palmyra Atoll, and Wake Island (Ragen and Lavigne, 1999). Previously rare in the MHI, sightings have increased and births have been documented on all major islands (Baker and Johanos, 2004). In 1976, the Hawaiian monk seal was listed as endangered under the U.S. Endangered Species Act. Recent estimates indicate the entire population includes around 1200 individuals (Littnan et al., 2015), with 90% occurring in the NWHI (NMFS, 2009). Although the population has been declining for many decades (4.5%/yr)(NMFS, 2009), according to Caretta et al. (2013) the MHI population is increasing (6.5%/yr). Although they are more abundant in NWHI, emergent land there is extremely limited (Ragen and Lavigne 1999).

Hawaiian monk seals are large solitary mammals with long developmental periods. They spend most of their life in the ocean, but also regularly haul-out onto beaches to rest and bask (Westlake and Gilmartin 1990). Hawaiian monk seals depend on coastline habitat for breeding where they give birth between February and August. Seal pups are especially vulnerable in the early stage of life while they are nursing and as they learn to forage as juveniles. Juvenile and adult Hawaiian monk seals forage primarily 50 – 300 meters, but up to depth of 500 meters. Foraging in a variety of habitats with low relief, they eat a wide range of fish and invertebrates, including octopus, wrasses, eels, and crustaceans (Stewart et al. 2006).

Hawaiian monk seals are non-migratory and typically remain near their natal island, although limited inter-island and, to a lesser extent, long-range movements have been observed (NMFS, 2009; Littnan et al., 2006). However, migration of individuals from the NWHI to the MHI is rare, and the expectation is that with decreasing populations and limited land availability, the population in the MHI has the potential to become more important for the recovery of the species (NMFS 2007).

Monk seals haul out at MCBH in Kaneohe Bay occasionally. Frequently the same seal is observed repeatedly. For example, a seal known as KC was observed 12 times in 2011, and has been observed every year since 2007, with the exception of 2014. Two seals, in particular, haul out with some regularity at MCB Hawaii Kaneohe Bay beaches. Of the 121 haul out events from 2004 – 2015, seven records (5.8%) are for events near the Pali Kilo project area. In 1996, a monk seal gave birth on the shoreline of the southern cove near the Pali kilo beach cottages and remained there for 54 days with its one pup (Bookless pers. comm. 2015). The frequency that

monk seals have been observed at MCBH is similar to population trends observed throughout the MHI population.

According to the life history of Hawaiian monk seals both juvenile and adult life stages could be affected by the proposed action when they haul-out to bask or to give birth. The 2007 Recovery Plan (NMFS 2007) lists human interaction, as a serious threat. Other serious threats include disease, aggression from adult male monk seals, fishery interactions, and habitat loss; while critical threats, which disproportionately impact juveniles, include food limitation, entanglement and predation.

Juvenile monk seals often do not have the stamina to forage as efficiently as adults, and may not be able to access deeper forage areas. As a result, food limitation impairs recruitment of juveniles to the adult life stage. Derelict fishing gear is a leading cause of entanglement, especially for juveniles. However, many other types of marine debris can cause mortality or injury to Hawaiian monk seals (NMFS, 2007). Predation scars are commonly observed on both juvenile and adult Hawaiian monk seals, mostly likely from tiger sharks.

Human interaction impacts (not including fishery interactions or possible disease vectors) can be manifest in a variety of ways, but can be generally grouped into two types: reduction of habitat through avoidance, and harassment. The coastline of the MHI is largely subject to coastal development and/or recreation at some measureable level. This may cause Hawaiian monk seals to avoid utilizing this potential habitat, which is effectively habitat loss. Additionally, were Hawaiian monk seals are utilizing habitats near humans, they may be harassed by people, causing them to alter their behavior patterns. It is also possible that humans may intentionally kill or injure Hawaiian monk seals (NMFS, 2007).

3.2 Critical Habitat in the Action Area

There is no designated critical habitat for any listed marine species within or adjacent to the action area. Although coastlines on Oahu in general were designated as Hawaiian monk seal critical habitat, MCBH was determined to be ineligible for this designation as a result of its lands and 500-yard marine buffer area being subject to an Integrated Natural Resource Management Plan [Federal Register Volume 80, Number 162 (Friday, August 21, 2015), Pages 50925-50988].

Likewise, the action area for the project is not adjacent to the Hawaiian Islands Humpback Whale National Marine Sanctuary.

4.0 EFFECTS OF THE ACTION ON ESA-LISTED SPECIES

This section analyzes the potential impacts that the proposed expansion of facilities at Pali Kilo Cottages is expected to have on green sea turtles, hawksbill sea turtles, and Hawaiian monk seals. Each subsection addresses the individual stressors expected to result from the Project. The analyses are based on construction design, construction methods and BMPs, anticipated recreational activities and conservation measures, the biology and life history characteristics of the protected species, and on the overlaps between habitats used by the species and the action area. A comprehensive list of BMPs and conservation measures is provided in Sections 6 and 7, respectively.

The green sea turtle, the hawksbill sea turtle, and the Hawaiian monk seal are protected under the Endangered Species Act (ESA). Among the protections afforded these species under that act is protection from being physically harmed and/or harassed. Additionally, Hawaiian monk seals are protected by the Marine Mammal Protection Act (MMPA). Both laws require people to actively avoid interactions with protected species and to maintain distances that do not negatively impact animal behaviors.

The proposed action has the potential to interact directly and indirectly with ESA-listed species through the following stressors:

- disturbances from human presence and recreational activities;
- exposure to elevated noise levels during construction;
- exposure to sedimentation, wastes, and discharges.

4.1 Disturbance from Human Presence

4.1.1 Construction Area

Both green sea turtles and Hawaiian monk seals have the potential to use the south beach cove portion of the Pali Kilo shoreline to haulout. Likewise, it is conceivable, however unlikely, that both hawksbill and green sea turtles could nest at south beach cove. If seals and/or turtles were out of the water, utilizing the shoreline they would be vulnerable to direct impacts from disturbance as a result of construction activity nearby. Once construction is completed, seals and turtles utilizing the shoreline would be vulnerable to indirect impacts via disturbance from guests of The Cottages at Kaneohe Bay.

The likelihood of disturbance to protected species on land is low. Only a small percentage (5.8%) of Hawaiian monk seal haulouts have been recorded along the Pali Kilo coastline since 2004, and only one has ever been documented pupping along this shoreline. No sea turtle haulouts, nestings, or strandings have been recorded in this area. Both Hawaiian monk seals and sea turtles seem to prefer to utilize the nearby Pyramid Rock Beach, which is a big sandy beach on the north side of the peninsula. This preference is likely because Pyramid Rock Beach is easily accessible, being adjacent to deep water. The Pali Kilo reef flat is very shallow; therefore, getting to the shoreline easily is limited to the period around high tide, and much of the shoreline (except south beach cove) is rocky and steep.

Direct effects to protected species will be abated through the implementation of construction BMPs that ensure that utilization of the shoreline habitat is systematically monitored for ESA-listed species presence, and the appropriate measures are in place to ensure maximum protection from disturbance during construction. For example, if a haul-out is detected, construction will be suspended within 50 yards. Additionally, the new lodging units will be constructed with outdoor lighting fixtures that contain design elements to minimize light pollution along the shoreline (e.g. shielding).

For the long term, MCBH policy dictates that when sea turtles and/or monk seals haulout on land, MCBH natural resources staff follows a series of protective conservation measures that are used on many beaches in Hawaii. These conservation measures include posting signs that direct the public to stay away from and not to disturb the protected animals, and erecting

physical barriers to separate humans from the animals, which ensures compliance with the ESA and MMPA. Where these conservation measures are followed, indirect impacts to sea turtles and seals will be minimized, and they can safely haulout without disturbance or harm coming to them. Therefore, human physical presence on land may affect, but is not likely to adversely affect protected species because effects would be insignificant.

4.1.2 Marine Area

While in the marine environment Hawaiian monk seals, green sea turtles, and hawksbill sea turtles may be indirectly impacted by recreational activities such as snorkeling, swimming, and spearfishing. Sea turtles utilize the marine environment on the Pali Kilo coast as forage areas, for resting or refugia, or simply transiting through. Likewise Hawaiian monk seals are in the Pali Kilo coast marine environment as well, most likely in transit. As such, seal and sea turtles are susceptible to disturbance by human physical presence in the marine environment, which may cause them to alter their behavior; however, these protected species are highly mobile and able to avoid direct impacts from this type of disturbance. Therefore, human presence in the water may affect, but is not likely to adversely affect protected species because effects would be insignificant.

Green and hawksbill sea turtles, and Hawaiian monk seals, can be directly impacted by derelict fishing gear, including hooks, line, and weights. Like other marine debris, these abandoned items can puncture tissues, become entangled around, and/or be ingested by protected species, causing significant injury and possibly mortality.

Passive human interactions with protected species and selection of appropriate fishing techniques that do not harm protected species can be encouraged through various outreach and enforcement efforts. Successful outreach conducted by MCCA includes enacting policies, creating educational and regulatory signage, and providing outreach materials that educate guests on behaviors that avoids and/or minimizes impacts to protected species. Successful outreach is accompanied by consistent enforcement of enacted policies, in addition to base, state, and federal laws. Therefore, fishing interactions may affect, but are not likely to adversely affect protected species because effects would be insignificant.

4.2 Exposure to Elevated Noise Levels during construction

Both green sea turtles and Hawaiian monk seals have the potential to use the south beach cove portion of the Pali Kilo shoreline to haul out. Likewise, it is conceivable, however unlikely, that both hawksbill and green sea turtles could nest at south beach cove. While on land, these protected species are capable of hearing project related noise. If these sounds are loud enough, they may cause direct impacts.

Hawaiian monk seals can perceive frequencies between 75 Hz and 75 kHz (Southall et al 2007). Sea turtles have low-frequency hearing, with their greatest sensitivity being below 1 kHz (Ridgway et al. 1969, Bartol et al. 1999). Sea turtle hearing is poorly understood; however, the best available information suggests sea turtles can hear low frequencies between 200 and 700 hertz (Hz) (Ridgway et al. 1969).

NMFS identifies general exposure thresholds for construction activities: 1) the onset of hearing injury for cetaceans is exposure to 180 decibels (dB) re 1 micro Pascals (μPa) rms (root mean squared) and 190 dB re 1 μPa rms for pinnipeds; 2) the onset of behavioral disturbance for all marine mammals is 160 dB re 1 μPa rms for impulsive sounds and 120 dB re 1 μPa rms for non-impulsive sounds. In the absence of turtle-specific thresholds, the marine mammal thresholds are applied and are believed to be conservative for sea turtles.

Best management practices (BMPs) implemented during construction, will include regular surveys of the shoreline to detect the presence of protected species when they haulout to rest, bask, and/or nest. These BMPs require work stoppages and protective measures as described in Section 6.1, which would minimize impacts to protected species from elevated noise during construction. Therefore, noise levels during construction may affect, but are not likely to adversely affect protected species because effects would be insignificant and unlikely to occur.

4.3 Exposure to Sedimentation, Wastes, and Discharges

The construction of new facilities could increase stormwater runoff and increase the potential for Hawaiian monk seals, green sea turtles, and hawksbill sea turtles to experience direct and indirect impacts from sedimentation, wastes, and discharges from these facilities.

Construction BMPs will ensure that all runoff is contained onsite during construction to protect water quality in nearshore waters adjacent to the Pali Kilo shoreline. Likewise any accidental hazardous waste spills will be contained and prevented from entering the marine environment. During construction the waterfront will be well protected by silt fences and/or coir logs to prevent erosion and runoff during rain. Therefore, exposure to increased runoff carrying sediments, wastes, and discharges may affect, but are not likely to adversely affect protected species because effects would be insignificant.

The preventative architectural and engineering design elements of the facilities will ensure runoff is retained onsite over the long-term to avoid increased runoff into the shoreline and nearshore habitats. Conservation measures will be in place to prohibit the clearing of trees along the shoreline and creating of social trails. Therefore, exposure to increased runoff carrying sediments, wastes, and discharges may affect, but are not likely to adversely affect protected species because effects would be insignificant.

4.4 ESA Conclusion

Based on an assessment of available biological information, the Navy finds that the expansion and operation of the MCCA cottages along the Pali Kilo shoreline may affect but is not likely to adversely affect ESA-protected species because the effects of the project are discountable or insignificant. All possible and potential impacts of the proposed action will be successfully mitigated by following best management practices and/or through a combined outreach and enforcement effort between the MCCA and MCBH.

MCCA will provide guests of Pali Kilo Cottages with educational material that specifically presents all relevant policies, MCBH regulations, and state and federal laws. The educational materials will discourage guests' behaviors that can negatively impact ESA-protected species and/or EFH.

Additionally, these materials will instruct guests how to safely and responsibly enjoy the marine resources found in the nearshore waters of the Pali Kilo coastline. MCCC will also post conspicuous signage at shoreline access points that reiterates the material presented in the educational materials described above, and will also include reporting instructions. MCBH will provide support to MCCC through more rigorous enforcement of policies, regulations, and laws that protect ESA-protected species.

5.0 ESSENTIAL FISH HABITAT ASSESSMENT

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires federal agencies to consult with the Secretary of Commerce for any action or proposed action authorized, funded, or undertaken by the federal agency that may adversely affect Essential Fish Habitat (EFH). National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) and the Regional Fishery Management Councils are charged with identifying EFH for all species managed under Federal fishery management programs.

5.1 Environmental Baseline Conditions

Pali Kilo shoreline is part of the Mokapu Peninsula coast on Marine Corps Base Hawaii. It is a predominantly rocky and steep coast, with a few small pocket beaches, as well as a small cove at south beach cove on the southern extent. The marine habitat along the Pali Kilo shoreline is a typical fringing reef structure with a shallow limestone reef flat that gradually becomes deeper. Three relatively distinct reef flat areas (strata) are apparent: a shallow reef flat, a shallow reef flat with channels, and a deeper reef flat (Figure 3, NAVFAC 2015). Past this area, the reef flat begins to slope downward to increasing depths and wave-exposure. The extent of the area of consideration is the reef flat areas and slope down to approximately 15 feet.

Rugosity, or habitat complexity, is greatest in the channelized strata, followed by the deep flat, and is least rugose in the shallow flat strata (NAVFAC 2015). The depth range occurring across strata is not large; the maximum depth at any survey location was 3.3 feet (one meter). The shallow flat and channelized strata are similar in average depth (0.20 -0.25 meters). The deep flat strata had an average depth of approximately 0.45 meters. Depths and rugosity of the reef slope were not evaluated.

Pali Kilo reef flats are mainly dominated by stony coral (hereafter coral) and algae communities. Coral species richness is low and homogenous among strata (Table 2). The two most abundant species of coral were *Porites compressa* and *Montipora capitata*. These two species occur in all strata and account for 98% of all live coral. The deep flat stratum is the most speciose of the three strata, where *Montipora flabelata* is present (pers. comm. A. Richards-Dona). As the deep flat gives way to the slope, *M. flabelata* cover increases. Otherwise three additional species are also found in all strata: *Cyphastrea ocellina*, *Pocillopora* sp, and *Pavona* sp. Coral cover is qualitatively similar to other reef flats in Kaneohe Bay (Jokiel et al. 2015, pers. comm. A. Richards-Dona). The deep and channelized reef flats have between 32-35% coral cover, while the channelized stratum had less (22%). Coral cover on the reef slope was not quantified.

The structure of coral communities in the nearshore Pali Kilo coast is similar to those found on other reef flats and wave-exposed slopes in Kaneohe Bay (Jokiel et al. 2015, pers. comm. A.

Richards-Dona); however, the particular micro-atoll morphology found in the shallow flat strata is uncommon (Cox et al. 2013).

Coral damage was lowest in the channelized strata, where 22% of the sites had minor damage (small coral tips that were broken). It is likely that damage estimates were lower because in this stratum corals tend to grow on the sides of the channels and not on upward facing surfaces. In the deep flat strata, 42% of the sites that had minor coral damage (evenly split between new and old damage). Damage was observed in more than 50% of the sites in the shallow flat strata; 33% with minor damage, and 20% sites with large coral heads broken and turned over. In deeper water, on the reef slope, coral damage was not often observed, possibly because the dominant coral growth forms in this habitat are massive rather than branched (pers. comm. A. Richards-Dona).

Across species and morphologies, algae were most abundant in the channelized strata, followed by the deep flat strata, and least abundant in the shallow flat strata (Figure 3). The most common macroalgae was *Dictyota* sp., followed by species of the genera *Hydrolithon*, *Acanthophora*, *Sphaecelaria*, *Padina*, *Turbinaria*, and *Acrosymphyton*. A turf alga was homogenous throughout the entire area.

Interestingly, the invasive algae, *Acanthophora spicifera*, covered large portions of the shallow flat strata nearest to shore at the beginning of surveys, however, several months later (March 2013) *A. spicifera* was isolated in small patches (1 inch tall and 12 inch wide) were present. Although algae were present at all sites, extensive growth onto healthy/live coral was not prevalent. Anecdotally, mats of cyanobacteria have been observed on the reef along Pali Kilo shoreline, and they may be advancing (pers. comm. A. Richards-Dona). Blooms of this blue-green algae are often associated with increased nutrient availability.

During the NAVFAC nearshore marine resources assessment surveys conducted in 2012-2013 no sea turtles or monk seals were observed in the action area. However, during regular monthly snorkel surveys over the past few years, Angela Richards-Dona of the University of Hawaii has reported seeing an average of two green turtles per 1-3 hours in this area. Typically the sea turtles are observed swimming away, presumably from either resting or foraging.

5.2 Current Impacts

Currently, the near-shore marine resources in this area experience recreational use by snorkelers, kayakers, and fishers (both rod and reel and spear).

Coral damage was observed in all parts of the study area with the most damage found closest to the shoreline. Being located adjacent to an access point, it is probable that the entire study area is impacted by snorkelers, spearfishers, tako (octopus) hunters, and other users. Due to very shallow depths adjacent to the shore, it is likely that users walk, crawl, and/or stand in these areas, possibly causing coral damage. Additionally, it is likely that spearfishers miss their targets, causing minor damage to live corals. However, it is notable that corals with minor damage did not appear to be stressed, and overall health did not appear to be jeopardized. Additionally, the overturned heads of coral found in several locations along the flat and channeled strata, had continued to grow and some of them had coral growing upward, demonstrating recovery. It is likely that tako hunters are responsible for overturning the large coral heads in pursuit of

octopus (Bruggemann et al., 2012). Both spearfishers and tako hunters were frequently observed in the vicinity during the surveys. It is unknown if resource use is predominantly related to the , the Marine Corps Base Hawaii residents, or from nearby local communities. MCBH allows fishing and octopus harvest in the study area. However, MCBH also prohibits damage to coral and live rock.

In deeper water, such as the deep flat area, where people can begin to swim comfortably, coral reefs are less likely to experience impacts from snorkelers standing, walking, or crawling on the substrate. In the channelized flat area, corals predominantly grow on the sides of the channels, but not on the upward-facing surfaces. It is unclear if this is due to long term impacts by recreational users (walking on the reef), or as a response to environmental variables (e.g. light intensity, temperature). Recreational users could walk in the sand channels and impact corals; however, it is unlikely based on low levels of damage observed there and a general tendency for people to walk in the shallowest area available.

The entire reef flat study area has a high likelihood of being affected by recreational users because it is adjacent to the south beach access point and is shallow. Users who enter the water from that location are very likely to walk out on the reef until they reach deeper water. Anthropogenic impacts from recreation present an interesting challenge to resource managers, because solutions are all based in regulating and influencing human behavior.

5.3 EFH and Federally Managed Fish Species

The Western Pacific Fishery Management Council (WPFMC) Hawaii Fishery Ecosystem Plan (FEP) designates waters around Oahu, including Kaneohe Bay as EFH. Additionally, Kaneohe Bay is designated as a habitat area of particular concern (HAPC) (WPFMC 2009). EFH has been designated for all of Kaneohe Bay under the following WPFMC FEP: subsections on Bottomfish, Crustacean, and Coral Reef Ecosystem for all life states (eggs, larvae, juveniles, and adults). The marine component of EFH is defined as “all waters and substrates (mud, salt, shell, rock, hard bottom, and associated biological communities) from the shoreline to the seaward limit of the Exclusive Economic Zone”.

Table 1. EFH and HAPC Designations Relevant to the Pali Kilo Project Area

Management Unit (MUS)	Species Complex	Essential Fish Habitat (EFH)	HAPC
Bottomfish and Seamount Groundfish	Shallow-water species (0–50 fm): uku (<i>Aprion virescens</i>), thicklip trevally (<i>Pseudocaranx dentex</i>), giant trevally (<i>Caranx ignobilis</i>), black trevally (<i>Caranx lugubris</i>), amberjack (<i>Seriola dumerili</i>), taape (<i>Lutjanus kasmira</i>)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm) Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	N/A
Bottomfish and Seamount Groundfish	Deep-water species (50–200 fm): ehu (<i>Etelis carbunculus</i>), onaga (<i>Etelis coruscans</i>), opakapaka (<i>Pristipomoides filamentosus</i>), yellowtail kalekale (<i>P. auricilla</i>), kalekale (<i>P. sieboldii</i>), gindai (<i>P. zonatus</i>), hapuupuu (<i>Epinephelus quernus</i>), lehi (<i>Aphareus rutilans</i>)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm) Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	N/A
Crustaceans	Spiny and slipper lobster complex: Hawaiian spiny lobster (<i>Panulirus marginatus</i>), spiny lobster (<i>P. penicillatus</i> , <i>P. spp.</i>), ridgeback slipper lobster (<i>Scyllarides haanii</i>), Chinese slipper lobster (<i>Parribacus antarcticus</i>), Kona crab (<i>Ranina ranina</i>)	Eggs and larvae: the water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm) Juvenile/adults: all of the bottom habitat from the shoreline to a depth of 100 m (50 fm)	N/A
Coral Reef Ecosystems	All Currently Harvested Coral Reef Taxa All Potentially Harvested Coral Reef Taxa	EFH for the Coral Reef Ecosystem MUS includes the water column and all benthic substrate to a depth of 50 fm from the shoreline to the outer limit of the EEZ	Kaneohe Bay

Source: Fishery Ecosystem Plan for the Hawaii Archipelago (WPRFMC, 2009)
fm – fathoms; EEZ – exclusive economic zone

5.4 Fishes and Habitat in the Project Area

Of the three reef flat strata described in the marine resource survey (NAVFAC 2015) along the Pali Kilo shoreline, the channelized and shallow reef flats are most likely to experience impacts from increased recreational use as a result of the proposed action. Within those strata, the seafloor and the water column are both considered EFH for coral reef, bottomfish, and crustaceans. The fish and habitat resources for this portion of the Pali Kilo shoreline and nearshore reef flat are described in detail in the marine resource survey conducted to support this EFH analysis (NAVFAC 2015), but will be summarized here. Additionally, Section 4, above, provides environmental baseline conditions for the relevant portions of the action area. The reef slope stratum was not quantified for this analysis, but is unlikely to experience adverse impacts (Section 5.2), and therefore generally omitted in the following description and impacts analysis.

Shallow Flat

This is the area fronting south beach cove and slightly toward the west. Massive corals dominate this strata, especially *Montipora capitata* and to a lesser extent *Porites compressa*. These two

species comprise 98% of all live coral cover in this area and in this area exhibit “micro-atoll” coral morphology. The other three corals common among strata are present in the shallow flat in very low abundances. The invasive algae *Acanthophora spicifera* appears to colonize the substrate here seasonally. Juvenile parrotfish, which are found in great numbers, likely use this area a refugia from predators which are limited by the shallow depths in this strata. Gobies are also found in abundance. Mussels, worm snails, and small crustaceans are common.

Channelized Flat

This is the area fronting south beach cove following the shoreline toward the east. This strata is dominated by algae to a greater extent than the other two strata. Like the shallow flat, depth here is very shallow. This stratum has the least amount of live coral cover of the entire action area. Where corals are found, they tend to line the sandy channels that are characteristic of this area. Gobies are the most abundant type of fish found, as well as juvenile parrotfish. Sponges are under-represented compared with other strata and anthozoids are absent.

Deep Flat

This is the slightly deeper area north of both the shallow and channelized flats. Percent coral cover is similar to the shallow flat (35%), but one species, *Montipora flabellata*, was only observed here. A slight shift in the fish community is exhibited here, from juvenile parrotfish and gobies to larger bodied surgeonfish and wrasse. Additionally some uncommon predators were found here (lizardfish and morey eel). Snails, crabs and shrimp were found in notably fewer numbers in this strata that is deeper and more suitable for predatory fishes. Urchins are slightly more abundant here than in the more shallow areas.

Table 2. Percent live coral cover among strata by species, 2012 – 2013 (NAVFAC 2015).

Genus species	Shallow	Channels	Deep
<i>Porites compressa</i>	7.94	9.89	8.17
<i>Montipora capitata</i>	25.84	11.89	23.50
<i>Montipora flabellata</i>	0.00	0.00	0.01
<i>Cyphastrea ocellina</i>	0.17	0.28	0.18
<i>Pocillopora</i> sp	0.02	0.01	0.27
<i>Pavona</i> sp	0.57	0.01	0.22
Total	34.54	22.07	32.35

Reef fish species richness was similar throughout the action area, 15 species were recorded in the channelized strata, 17 in the deep flat strata, and 18 in the shallow reef strata. Overall, 27 species of fish were identified with surgeonfish, butterflyfish, and damselfish being the most abundant families. Reef fish abundances were grouped by family, totaled, and averaged for comparison among strata (Table 2).

Table 3. Fisheries species potentially affected by the Project. Surveys from 2012 and 2013 (NAVFAC 2015).

PHYLUM, CLASS, ORDER, FAMILY	Genus species	Common name; Hawaiian name	Abundance by stratum		
			Shallow	Channels	Deep
SYNODONTIDAE					
	<i>Synodus</i> sp*	lizardfish			1
HOLOCENTRIDAE					
	<i>Myripristis</i> sp*	squirrelfish	1	1	
MULLIDAE					
	<i>Parupeneus</i> sp*	goatfish		1	1
CHAETODONTIDAE					
	<i>Chaetodon auriga</i>	Threadfin butterflyfish; Kīkākapu	3		1
	<i>Chaetodon linula</i>	Raccoon butterflyfish; Kīkākapu	5		
	<i>Chaetodon lunulatus</i>	Oval butterflyfish; Kapuhili	1		
	<i>Chaetodon unimaculatus</i>	Teardrop butterflyfish		5	
	<i>Chaetodon</i> sp1*	butterflyfish		1	
	<i>Chaetodon</i> sp2*	butterflyfish			1
POMOCENTRIDAE					
	<i>Abudefduf abdominalis</i>	Hawaiian sergeant major damsel; Mamo	5	6	
	<i>Dascyllus albisella</i>	Hawaiian dascyllus; 'ālo'ilo'i		3	
	<i>Chromis</i> sp*	Chromis	2	1	3
LABRIDAE					
	<i>Gomphosus varius</i>	Bird wrasse; Hīnālea 'i'iwi	4	1	1
	<i>Stethojulis belteata</i> *	Belted wrasse			1
	<i>Thalassoma duperrey</i>	Saddle wrasse; Hīnālea lauili	7	7	11
	<i>Thalassoma trilobatum</i>	Christmas wrasse	4	1	1
SCARIDAE					
	<i>Chlorurus spilurus</i>	Bullethead parrotfish; Uhu	25		20
	<i>Scarus psittacus</i>	Palenose parrotfish; Uhu	600	167	160
GOBIDAE					
	<i>Asterropteryx semipunctatus</i>	Halfspotted goby	294	254	80
	<i>Psilogobius mainlandi</i>	Hawaiian shrimp goby	11	1	3
ACANTHURIDAE					
	<i>Acanthurus achilles</i>	Achilles tang; Pāku'iku			1
	<i>Acanthurus nigroris</i> *	Bluelined surgeonfish; Māi'i'i			1
	<i>Acanthurus triostegus</i>	Convict tag; Manini	88	45	50
	<i>Acanthurus</i> sp1*	surgeonfish	1	1	
	<i>Acanthurus</i> sp2*	surgeonfish			2
	<i>Acanthurus</i> sp3*	surgeonfish			1
BALISTIDAE					
	<i>Rhinecanthus rectangulus</i>	Reef triggerfish; Humuhumunukunukuāpua'a	1		
OSTRACIIDAE					
	<i>Ostracion meleagris</i>	Whitemouth moray; Puhi 'ōni'o			1

5.5 Assessment of Potential Impacts to Essential Fish Habitat

The nearshore area near the proposed Pali Kilo cottages project has been designated as Essential Fish Habitat (EFH), for several management unit species (MUS) and Kaneohe Bay is a habitat area of particular concern for Coral Reef Ecosystem (Table 1). Adverse impacts are expected only on the reef flat, not the reef slope (Section 5.2), and therefore the reef slope is omitted from further impacts analysis.

The construction of new facilities could increase stormwater runoff and increase the potential for EFH and MUS on the reef flat to experience adverse impacts from sedimentation, wastes, and discharges from these facilities. Construction BMPs will ensure that all runoff is contained onsite during construction to protect water quality in nearshore waters adjacent to the Pali Kilo shoreline. Likewise any accidental hazardous waste spills will be contained and prevented from entering the marine environment. During construction the waterfront will be well protected by silt fences and/or coir logs to prevent erosion and runoff during rain. Therefore, exposure to increased runoff carrying sediments, wastes, will be minimized and adverse impacts to EFH and MUS will be negligible.

The preventative architectural and engineering design elements of the facilities will ensure runoff is retained onsite over the long-term to avoid increased runoff into the shoreline and reef flat habitats. Conservation measures will be in place to prohibit the clearing of trees along the shoreline and creating of social trails. Therefore, increased runoff over the longterm that could carry sediments, wastes, and discharges will be minimized and adverse impacts to EFH and MUS on the reef flat will be negligible.

Table 4. Potential impact assessment summary of project activities on MUS

Project Activity	Impact Assessment
Physical Habitat Modification	Substantial permanent direct impacts caused by walking and standing on the reef, breakage of corals and substrate, moving corals and substrate.
Harvest	Substantial permanent direct impacts through removal MUS species (including corals).
Fishing Activity	Minimal temporary direct impacts to MUS (especially coral reef) from abandoned derelict fishing gear (Lines, hooks, weights).
Suspended Sediments	Minimal indirect temporary impacts to MUS from people moving through the water column and suspending sediments, making MUS prey more difficult to obtain.
Human Presence	Minimal indirect temporary effects by recreational users in the water column through that cause MUS modify their behavior (i.e. avoidance).

Recreation at the Pali Kilo shoreline and on the nearshore reef flat has the potential to adversely affect EFH for various reasons (Table 4). When people swim and/or snorkel in shallow marine habitats they cause adverse impacts to mobile MUS, causing them to alter their natural behavior, and by re-suspending sediments. It is possible that it will be more difficult for demersal fish and crustaceans to find prey could due to increased turbidity and human presence. However, These MUS are highly mobile and able to actively avoid impacts by snorkelers and swimmers. Corals could also experience impacts from sediment re-suspension,

causing a loss of energy from photosynthetic symbionts and a metabolic loss in resources diverted to sloughing off sediments. These impacts are expected to be temporary and minimal, and similar to natural processes that occur in this area from wave and tidal action.

Adverse impacts to EFH and MUS occur on the reef flat as a result of poorly informed recreational users: kayakers, fishers, snorkelers, spearfishers, and octopus hunters. Fishers can have adverse impacts to EFH and MUS through targeted harvest and by damage to the substrate itself through improper fishing techniques. There is evidence at this time that recreational users cause damage to the corals on the reef flat by (1) walking, standing on or dragging kayaks on the reef flat, (2) fishers who hitting the shallow reef flat substrate with spears and leave derelict fishing gear (hooks, line, weights), and (3) by moving rocks and coral in pursuit of hiding octopus on the nearshore shallow reef flat. These adverse impacts could be substantial, and most would be permanent, except for derelict fishing which could be removed.

Conservation measures to minimize of all potential longterm adverse impacts to EFH and MUS from recreational users of Pali Kilo Cottages will include improved education and outreach, and improved compliance with state and MCBH regulations, and applicable environmental laws. Outreach material, including a mandatory video for each guest, will be included as part of their registration and check-in processing. These materials will direct guests on how to enjoy the marine environment without harming it, including navigating tides to avoid harming the reef at low tide. The content will be made available to MCBH from MBH Environmental Division. People seeking a recreational experience without these prophylactic measures for marine resource protection will be directed to other beaches, such as Pyramid Rock Beach. The combination of outreach, education, and the highly compliant guests will effectively minimize adverse impacts on EFH and MUS.

5.6 EFH Conclusion

Adverse impacts during construction of the additional cottage facilities will be negligible because construction BMPs and conservation measures will be implemented. Implementing BMPs will minimize avoid adverse impacts during construction. Specific attention to include engineering design elements will minimize longterm adverse impacts from increased runoff and waste discharges from the new facilities. Although there is potential for substantial longterm adverse impacts from recreational use of the shoreline from guests of The Cottages at Kaneohe Bay, these impacts can be successfully minimized through adjusted human behavior. MCBH will enact policies, create signage, and provide outreach materials that educate users in behavior that avoids and/or minimizes impacts to MUS and EFH. MCBH will provide support to Pali Kilo Cottages through development of content for educational and outreach materials (including signage). With a combined effort between the MCBH and MCBH, the proposed action is expected to result in negligible or minimal adverse effect MUS and EFH. Compliance will be ensured through monitoring of guest behavior and loss of resource-use penalties for non-compliance. Efficacy of policies will be determined through third-party monitoring of marine resources and an adaptive management strategy to change guests' resource use and access privileges if adverse impacts increase. It is entirely possible that improved outreach and better compliance will result in impacts levels lower than currently exist.

6.0 BEST MANAGEMENT PRACTICES (BMPs)

The following are BMPs that ensure protection of ESA-listed marine species during the construction of the proposed action.

1. The project manager shall designate at least one Lookout to monitor the shoreline and beaches adjacent to the proposed action for ESA-listed monk seals and sea turtles.
2. During construction, surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, and periodically throughout the day.
3. The presence of any Hawaiian monk seals or sea turtles on the shoreline will be reported to MCBH Natural Resource managers.
4. All work shall be postponed or halted if ESA-listed marine species are within 50 yards of the proposed work, if the marine species appears disturbed by construction activity regardless of distance, and shall only begin/resume after the animals have voluntarily departed the area.
5. All personnel will stay more than 100 ft (45.5 m) from monk seals and sea turtles that haul out on the beach.
6. Personnel will not perform work on or near the beach if turtle nesting is known or suspected to be occurring.

The following are BMPs that minimize adverse effects to the marine environment from construction-related activities.

7. A contingency plan to control hazardous materials shall be required.
8. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available. In the event of a hazardous material spill, the Environmental Dept will be immediately notified and standard remediation measures implemented.
9. The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
10. Fueling of land-based vehicles and equipment shall take place at least 100 feet away from the water, preferably over an impervious surface.
11. Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
12. A plan shall be developed and implemented to prevent debris and other wastes from entering or remaining in the marine environment during the project.

7.0 CONSERVATION MEASURES

1. At registration, administer required viewing of an educational video on the unique a fragile natural resources and responsible recreation practices for all occupants and guests, including those not residing overnight. (a suitable video has been produced

- and will be provided by MCBH, free reprinting service is available via MCBH Combat Camera). Additionally, informational pamphlets will be provided with the keys.
2. Facilities design must include drainage features that retain water runoff on site, and approved by MCBH.
 3. Facilities design must include lighting that is designed to avoid light pollution at the shoreline, and approved by MCBH.
 4. Non-native vegetation will not be planted in association with the landscaping of these properties. Landscaping will be consistent with the Base Landscape Manual; copies are available through the Environmental Dept. Vegetation clearing between cottages and the shoreline must be approved by the Environmental Dept.
 5. Post and maintain signs on cottage lanais or common areas of the Efficiency Units (EU) that provide information on the following requirements (content and cost estimate will be provided by MCBH Environmental Dept):
 - a. appropriate (legal) behavior with respect in the presence of sea turtles and monk seals and required notification procedures in the case of sea turtle and seal haul-outs;
 - b. authorized beach access areas and prohibition from creating and/or utilizing social trails to the shoreline;
 - c. appropriate (legal) behavior with respect to touching, standing, or walking on live rock or coral reef habitat;
 - d. appropriate (legal) fishing and resource extraction activities, however Rod and reel fishing from shore will be prohibited;
 - e. responsible waste and litter management;
 - f. invasive species management and proper cleaning of in-water gear to limit new introductions.
 6. MCBH Environmental Dept will post and maintain signs addressing the criteria in Conservation Measure 6 at beach access points.
 7. MCBH will post and maintain signs and information pamphlets addressing the criteria in Conservation Measure 6 on cottage lanais and in EUs.
 8. Develop and enact monitoring of guest behavior to evaluate compliance with responsible recreation guidance. Enforce non-compliance with guidance up to and including loss of access privilege and eviction of facilities.
 9. Provide in kind support to the Hawaii Institute of Marine Biology (HIMB) in exchange for biannual coral reef community resource health surveys to track trends of the marine environment (methods approved by MCBH) in the action area relative to reference areas. If anomalous negative trends are detected, restrict guest recreational behavior accordingly based on guidance from MCBH. In kind support could include providing use of boat and SCUBA tank fills. Final compensation TBD through an agreement with HIMB or another entity with appropriate expertise.

8.0 REFERENCES

- Balazs, G. H. 1976. Green turtle migrations in the Hawaiian archipelago. *Biological Conservation*, 9:125-140.
- Balazs, G. H. 1980. Synopsis of biological data on the green turtle in the Hawaiian Islands. U.S. Dep. Comm., NOAA Tech. Memo. NOAA-TM-NMFS-SWFC-7.
- Balazs, G. H. 1983. Recovery records of adult green turtles observed or originally tagged at French Frigate Shoals, Northwestern Hawaiian Islands. U.S. Dep. Comm., NOAA Tech. Memo. NOAA-TM-NMFS-SWFC-36, pp. 42.
- Balazs, G. H. and M. Chaloupka. 2004. Thirty year recovery trend in the once depleted Hawaiian green turtle stock. *Biological Conservation*, 117: 491-498.
- Balazs, G. H., P. Craig, B. R. Winston, and R. K. Miya. 1994. Satellite Telemetry of Green Turtles Nesting at French Frigate Shoals, Hawai'i, and Rose Atoll, American Samoa. From Proceedings of 14th Annual Sea Turtle Symposium. pp. 184-187.
- Bartol, S.M., J.A. Musick, and M.L. Lenhardt. 1999. Auditory Evoked Potentials of the Loggerhead Sea Turtle (*Caretta caretta*). *Copeia*, Vol. No. 3. August 2, 1999. pp. 836-840.
- Chaloupka M. and G.H. Balazs. 2007. Using Bayesian state-space modelling to assess the recovery and harvest potential of the Hawaiian green sea turtle stock. *Ecol Modell* 205:93–109
- Cox, T.E., K. Foster, N.C. Sukhraj, A. Montgomery, D. Polhemus, (2013) Benthic Community and Habitat Maps of Marine Resources at Marine Corps Base Hawaii, Kaneohe Bay, Oahu Island, Hawaii. (2013) Prepared for Marine Corps Base Hawaii. 137 pp.
- Dutton, P. and R. Leroux. 2008. Progress Summary of Genetic Analysis of Hawksbill Samples from the Hawaiian Islands. Unpublished report prepared for the 2008 Hawksbill Recovery Group Meeting. Marine Turtle Molecular Ecology Laboratory NOAA-Fisheries Southwest Fisheries Science Center-La Jolla.
- Littnan, C., Harting, A. & Baker, J. 2015. *Neomonachus schauinslandi*. The IUCN Red List of Threatened Species 2015: e.T13654A45227978. <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T13654A45227978.en>. Downloaded on 21 October 2015.
- Littnan, C. L., B. S. Stewart, P. K. Yochem, and R. Braun. 2006. Survey for selected pathogens and evaluation of disease risk factors for endangered Hawaiian monk seals in the main Hawaiian Islands. *EcoHealth*, 3: 232-244.
- Mortimer, J. A. and M. Donnelly. 2008. Marine Turtle Specialist Group 2007 IUCN Red List Status Assessment Hawksbill Turtle (*Eretmochelys imbricata*). <http://www.iucnredlist.org/documents/attach/8005.pdf>.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle (*Eretmochelys imbricata*). National Marine Fisheries Service, Silver Spring, MD.

National Marine Fisheries Service and U. S. Fish and Wildlife Service (2013) Hawksbill sea turtle (*Eretmochelys imbricata*) 5 year status review: Summary and conclusion. National Marine Fisheries Service, St. Petersburg, Florida.

National Marine Fisheries Service. 2007. Recovery Plan for the Hawaiian Monk Seal. Honolulu, HI, USA Available at: <http://www.nmfs.noaa.gov/pr/pdfs/recovery/hawaiianmonkseal.pdf>.

National Marine Fisheries Service. 2009. Stock Assessment Report for the Hawaiian Monk Seal (*Monachus schauinslandi*). Revised 09/26/2009.

Naval Facilities Engineering Command Pacific. 2015. Baseline Assessment of Marine Resources near the Cottages at Kaneohe Bay, Marine Corps Base Hawaii. 20 pgs.

Parker, D. M. and G. H. Balazs, 2011 [unpublished]. Draft Map Guide to Marine Turtle Nesting and Basking in the Hawaiian Islands. Marine Turtle Research Program, NOAA, National Marine Fisheries Service, Pacific Islands Fisheries Science Center.

Ragen, T. J. and D. M. Lavigne. 1999. The Hawaiian monk seal: biology of an endangered species. In: J. R. Twiss and R. R. Reeves (eds), *Conservation and Management of Marine Mammals*, pp. 224-245. Smithsonian University Press.

Ridgway, S. H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. PNAS, 64, 884-890.

Seminoff, J., A. Jones, T. T. Resendiz, A. Nichols, W. J. Chaloupka, and M.Y. Chaloupka. 2003. Monitoring green turtles (*Chelonia mydas*) at a coastal foraging area in Baja California, Mexico: Multiple indices describe population status. *J. Mar. Biol. Assn.*, 83: 1355-1362.

Southall B.L., Bowles A.E., Ellison W.T., Finneran J.J., Gentry R.L., Greene C.R.J., Kastak D., Ketten D.R., Miller J.H., Nachtigall P.E., Richardson W.J., Thomas J.A. & Tyack P.L. (2007) Marine mammal noise exposure criteria: Initial scientific recommendations. *Aquatic Mammals* **33**, 411-521.

Sustainable Resources Group Intn'l, Inc. (2011) Final Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (MCBH INRMP) (2011-2016). Prepared for Environmental Compliance and Protection Department for Marine Corps Base Hawaii. 160 pp.

Westlake, R. L. and W. G. Gilmartin. 1990. Hawaiian monk seal pupping locations in the northwestern Hawaiian Islands. *Pacific Science* 44: 366-383.

WPRFMC, 2009. Fishery Ecosystem Plan for the Hawaii Archipelago. In: Western Pacific Regional Fishery Management Council (Editor), Honolulu, Hawaii, pp. 286 pages.

9.0 APPENDICES

9.1 Appendix A: List of ESA-protected species for Hawaii (NMFS 2015)

MARINE PROTECTED SPECIES of the HAWAIIAN ISLANDS National Marine Fisheries Service, Pacific Islands Regional Office

MARINE MAMMALS

All marine mammals are protected under the Marine Mammal Protection Act. Those identified under the ESA Listing are also protected under the Endangered Species Act.

<u>Common Name</u>	<u>Scientific Name</u>	<u>ESA Listing</u>
Blue Whale	<i>Balaenoptera musculus</i>	Endangered
Blainville's Beaked Whale	<i>Mesoplodon densirostris</i>	
Bryde's Whale	<i>Balaenoptera edeni</i>	
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	
Dwarf Sperm Whale	<i>Kogia simus</i>	
False Killer Whale – Hawaiian Insular	<i>Pseudorca crassidens</i>	Endangered
False Killer Whale – Hawaiian Pelagic	<i>Pseudorca crassidens</i>	
Fin Whale	<i>Balaenoptera physalus</i>	Endangered
Humpback Whale	<i>Megaptera novaeangliae</i>	Endangered
Killer Whale	<i>Orcinus orca</i>	
Longman's Beaked Whale	<i>Indopacetus pacificus</i>	
Melon-headed Whale	<i>Peponocephala electra</i>	
Minke Whale	<i>Balaenoptera acutorostrata</i>	
North Pacific Right Whale	<i>Eubalaena japonica</i>	Endangered
Pygmy Killer Whale	<i>Feresa attenuata</i>	
Pygmy Sperm Whale	<i>Kogia breviceps</i>	
Sea Whale	<i>Balaenoptera borealis</i>	Endangered
Short-finned Pilot Whale	<i>Globicephala macrorhynchus</i>	
Sperm Whale	<i>Physeter macrocephalus</i>	Endangered
Bottlenose Dolphin	<i>Tursiops truncatus</i>	
Common Dolphin	<i>Delphinus delphis</i>	
Fraser's Dolphin	<i>Lagenodelphis hosei</i>	
Pantropical Spotted Dolphin	<i>Stenella attenuata</i>	
Risso's Dolphin	<i>Grampus griseus</i>	
Rough-toothed Dolphin	<i>Steno bredanensis</i>	
Spinner Dolphin	<i>Stenella longirostris</i>	
Striped Dolphin	<i>Stenella coerulescens</i>	
Hawaiian Monk Seal	<i>Monachus schauinslandi</i>	Endangered
Northern Elephant Seal	<i>Mirounga angustirostris</i>	

SEA TURTLES

All sea turtles are protected under the Endangered Species Act.

<u>Common Name</u>	<u>Scientific Name</u>	<u>ESA Listing</u>
Green Turtle	<i>Chelonia mydas</i>	Threatened
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	Endangered
Leatherback Turtle	<i>Dermochelys coriacea</i>	Endangered
North Pacific Loggerhead Turtle	<i>Caretta caretta</i>	Endangered
Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	Threatened

Last updated January 2015



Baseline Assessment of Marine Resources Near the Cottages at Kaneohe
Bay, Marine Corps Base Hawaii
April 2015



Prepared by:
Naval Facilities Engineering Command, Pacific
Department of Environmental Planning, Marine Resources



This page intentionally left blank.

TABLE OF CONTENTS

1. ABSTRACT.....	1
2. INTRODUCTION	1
3. METHODOLOGY	2
4. RESULTS	2
STONY CORAL.....	2
ALGAE.....	3
NON-CORAL SESSILE INVERTEBRATES	3
FISH.....	4
RUGOSITY AND DEPTH	4
PROTECTED SPECIES.....	4
5. DISCUSSION.....	4
FISHERY PRESSURE	5
RECREATIONAL PRESSURE	5
RECOMMENDATIONS	5
6. REFERENCES	6
7. FIGURES.....	7
<i>Figure 1: Reef area potentially impacted by recreational users at Pali Kilo cottages, MCBH</i>	<i>7</i>
<i>Figure 2: Percent coral cover evaluated by species among strata</i>	<i>8</i>
<i>Figure 3: Percent algae cover among strata (macro and turf).....</i>	<i>8</i>
<i>Figure 4: Sessile invertebrate abundance (log transformed) grouped by class among strata</i>	<i>9</i>
8. TABLES	9
<i>Table 1: Reef fish abundance grouped by family among strata</i>	<i>9</i>
<i>Table 2: Green sea turtle haul outs reported at MCBH, 2011-2015.....</i>	<i>10</i>
<i>Table 3: Hawaiian monk seal haul outs reported at MCBH, 2004-2015.....</i>	<i>10</i>
9. APPENDICES	11
APPENDIX A: RANDOMLY SELECTED TRANSECT SITES (GPS COORDINATES)	11
APPENDIX B: REPRESENTATIVE PHOTOS OF STRATA	12
APPENDIX C: RAW DATA	14
<i>Quadrat data - Coral.....</i>	<i>14</i>
<i>Quadrat data - algae</i>	<i>15</i>
<i>Algae Codes.....</i>	<i>16</i>
<i>Quadrat data – other macroinvertebrates</i>	<i>17</i>
<i>Other Macroinvertebrate Codes</i>	<i>18</i>
<i>Fish Data</i>	<i>19</i>
<i>Fish Codes</i>	<i>20</i>

This page intentionally left blank.

1. ABSTRACT

Marine resources in the near-shore waters along the Pali Kilo coastline of Marine Corps Base Hawaii in Kaneohe Bay, which may be utilized by cottage users, were assessed in this study. Transect and quadrat surveys were conducted to determine the species richness and abundance of fish, algae, coral and other invertebrates, and to evaluate habitat complexity, and the presence of protected species. The study area was divided into three strata shallow reef flat, channelized reef flat, and deep reef flat. Some variations were observed among strata, although the area appeared to be mostly homogenous, with intuitive differences. The marine resources are typical of those found in other similar fringing reef flats on Kaneohe Bay and elsewhere on Oahu, Hawaii. Some resource use impacts are apparent in the form of coral damage. These impacts could be mitigated for through increased outreach to users and increased enforcement of MCBH regulations.

2. INTRODUCTION

A proposal to expand the number of cottages along the Pali Kilo coastline was submitted by Marine Corps Community Services (MCCS), and an associated Environmental Assessment (EA) is underway. This Proposed Action consists of constructing up to 40 new units along the Pali Kilo coastline of Marine Corps Base Hawaii (MCBH). These proposed units involve adding up to 26 additional beach cottage units and a 14-unit lodge complex (referred to as the Efficiency Unit complex) to the existing 14-unit complex. This would increase the capacity of temporary recreational beach lodging units to accommodate additional patrons, meet the existing and future needs of patrons, and promote the overall morale and welfare of the United States Marine Corps (USMC) and United States Department of Defense (DOD) community.

The existing and proposed beach cottages and Efficiency Unit complex would be located adjacent to the Pali Kilo coastline and the South Beach area. Currently, the nearshore marine resources in this area undergo recreational use stress from including snorkelers, kayakers, spearfishers, and octopus fishers (known locally as tako hunters). It is possible that additional cottage facilities may result in increased recreational impacts to the marine resources along the Pali Kilo coastline. Marine biological resources that may be affected include Endangered Species Act (ESA) protected species, and Essential Fish Habitat.

A broad-scale the benthic habitat survey was completed in 2013 (Cox et al., 2013) in support of the MCBH Integrated Natural Resource Management Plan (INRMP). However, the near shore Pali Kilo shoreline was not subsampled systematically. Neither fish nor macro-invertebrate populations were included in these surveys. Both Cox et al. (2013) and the NOAA Atlas of Benthic Habitats (Battista et al., 2007), a product based in remote sensing data, describe the near-shore potential impact area as a mix of coral and algae dominated limestone pavement.

This report summarizes supplemental baseline marine resource surveys that were conducted in 2012 and 2013 to assess the condition of the benthic habitat, the fish and macro-invertebrate communities, and threatened and endangered species presence in the near-shore waters of the Pali Kilo coastline. Additionally, this report will support the impacts analysis for the MCBH Pali Kilo Cottages Expansion Project Environmental Assessment.

3. METHODOLOGY

Based on a pre-survey site visit, the fringing reef flat, where recreational impacts from cottage users would be expected to occur, was split into three strata: shallow flat, channelized flat, and deep flat. Representative photographs of each strata are found in Appendix A.

Based on a power analysis, approximately 2% of each strata was sub-sampled, along 35 transects surveys (15 flat, nine channelized, and 11 deep). Transect starting positions were randomly generated using Arc GIS (Appendix B) and located in the field using GPS. Each weighted ten-meter transect tape was oriented in a pre-determined and haphazardly-selected compass direction. Depth was measured at the beginning and end of each transect, and the time of day was recorded to compensate for tidal fluctuations.

Once a transect was established, a belt-transect snorkel survey was conducted (two meter wide) to quantify reef fish abundance, and size (when possible). Transects were evaluated a second time to record species and abundance of mobile invertebrates. Rugosity was then calculated, and planar video of the transect was recorded using a weighted reference string to maintain consistent distance above the substrate. Visible damage to stony corals (hereafter referred to as coral) within the belt-transect was noted, with particular focus on crushed, broken, and overturned coral.

To characterize the benthic community, one meter square quadrats were placed in two positions on the transect lines (0-1 and 5-6 meters). Within each quadrat, coral, algae, and other benthic invertebrate species were identified to the lowest possible taxa. Mobile and sessile macro-invertebrates (other than coral) were counted as individuals and percent cover of live coral and algae was visually estimated (*in situ*) to evaluate abundance. However, because cover estimates included hidden (e.g. under ledges) and vertical relief (in essence, 3D coral cover), our results are not directly comparable to standard quadrat surveys that only quantify cover visible from the planar perspective. Regardless, as a tool for evaluating coral resources present at the potential impact site, this modified methodology is useful. Particular care to consider this methodological modification should be made if an attempt is made to compare these data to future benthic cover estimates.

Fauna protected under the Endangered Species Act were evaluated from opportunistic visual observations made during field activities during these surveys, and from observations made by MCBH Natural Resource Management staff.

This report presents descriptive statistics only; parametric statistical analysis was not performed. However, the raw data can be obtained from Appendix C, should further analysis be desired.

4. RESULTS

Our results are reported with respect to the three strata, and focus on evaluating biotic species richness and relative abundance. Additionally, rugosity and depth were evaluated to characterize the relative complexity of the abiotic habitat.

Stony Coral

Species richness of stony coral was low and homogenous among strata (Figure 2). The two most abundant species of coral were *Porites compressa* and *Montipora capitata*, and these species accounted for 98% of all coral encountered in the quadrat surveys. The deep flat strata was the most speciose of

the three strata, where *Montipora flabelata* was observed (6 species total). In all three strata, limited amounts of *Cyphastrea ocellina*, *Pocillopora* (sp), and *Pavona* (sp) were recorded (five species total).

Percent coral cover was very similar in the shallow and deep flat strata (32% and 35%), and somewhat less in the channelized strata (22%), likely due to the regularity of bare sediment lining the channels. These estimates are consistent with estimates (10%-50%) identified in the NOAA Atlas of Benthic Habitats (Battista et al., 2007).

The structure of coral communities in the nearshore Pali Kilo coast is similar to those found on other reef flats in Kaneohe Bay (Jokiel et al., 2015); however, the particular micro-atoll morphology found in the shallow flat strata is uncommon.

Coral damage was lowest in the channelized strata, where 22% of the sites had minor damage (small coral tips that were broken). It is likely that damage estimates were lower because in this stratum corals tend to grow on the sides of the channels and not on upward facing surfaces. In the deep flat strata, 42% of the sites that had coral minor damage (evenly split between new and old damage). Damage was observed in more than 50% of the sites in the shallow flat strata; 33% with minor damage, and 20% sites with large coral heads broken and turned over.

Algae

Across species and morphologies, algae were most abundant in the channelized strata, followed by the deep flat strata, and least abundant in the shallow flat strata (Figure 3). The most common macroalgae was *Dictyota* sp., followed by species of the genera *Hydrolithon*, *Acanthophora*, *Sphaecelaria*, *Padina*, *Turbinaria*, and *Acrosymphyton*. Turf algae was similarly abundant.

Interestingly, the invasive algae, *Acanthophora spicifera*, covered large portions of the shallow flat strata nearest to shore at the beginning of surveys, however, several months later (March 2013) *A. spicifera* was isolated in small patches (1 inch tall and 12 inch wide) were present. Although algae were present at all sites, extensive growth onto healthy/live coral was not prevalent.

Non-Coral Sessile Invertebrates

Due to the large variation among taxa, abundances were log-transformed to facilitate relative comparison between groups. These abundances were relatively consistent among strata, with a few exceptions found in Anthozoa, Vermitidae, and Porifera classes (Figure 4).

Bivalves were the most abundant class of organisms found and were abundant in all strata. The Hawaiian mussel, *Brachidontes crebristriatus*, was the most common bivalve observed. Gastropods (snails and sea slugs) were also homogenous among strata. Sea urchins were the most abundant echinoderm, although brittle stars and sea cucumbers were also observed. Crabs and shrimp were the most common arthropods, although some barnacles were observed. Anenomes and zoanthids were common in the shallow flat strata, less common in the deep flat strata, and absent in the channelized strata. Many vermitids (worm shells or worm snails, and crustaceans) were not identified to species, except for *Dendropoma gregaria*. Vermitids. Vermitids were less abundant in the deep flat strata, but abundant in other strata. Sponges (Porifera) were not common in any strata, and especially rare in the channelized strata.

Fish

Reef fish species richness was similar among the three strata, 15 species were recorded in the channelized strata, 17 in the deep flat strata, and 18 in the shallow reef strata. Surgeonfish, butterflyfish, and damselfish were the most speciose across strata.

Parrotfish were the most abundant reef fish family across strata, but distinctly more abundant in the shallow flat strata. Gobies and surgeonfish were also notably abundant across strata, while wrasses, damselfish, and butterflyfish were present to a lesser extent. Reef fish abundances were grouped by family, totaled, and averaged for comparison among strata (Table 1). The shallow strata had the greatest number of fish, followed by the channelized strata, while the deep flat strata had the fewest reef fish. Biomass was not calculated due to inconsistent size estimates of fish. However, it is common on Hawaiian reefs for juvenile reef fish to utilize shallower habitat, where access by larger predators is restricted, and move toward the deeper water with increased size and development.

Rugosity and Depth

Rugosity was greatest in the channelized strata, followed by the deep flat, and least rugose in the shallow flat strata. The shallowest areas are often most subject to scour which typically has a flattening effect. The shallow flat and channelized strata were similar in average depth (0.20 -0.25 meters). The deep flat strata had an average depth of approximately 0.45 meters. The depth range occurring across strata is not large, and all strata are considered reef flat habitat.

Protected Species

During the course of the marine resource surveys, we did not observe any sea turtles (Hawksbill or Green). However, during similar fieldwork conducted by US Fish and Wildlife Service and the US Geological Survey (2010-2011), three Green sea turtles were sighted swimming or resting in the vicinity of the Pali Kilo shoreline (Cox et al. 2013), and in other areas around MCBH. Additionally, MCBH natural resource management staff recorded Green sea turtles that hauled out to bask (Table 2), but none in the vicinity of the Pali Kilo shoreline. (Pers Comm. T. Russell, 2012).

During the course of the marine resource surveys, we did not observe any Hawaiian monk seals. However, the natural resource management staff at MCBH maintains records of haul outs and strandings (Table 3). Seven of those events were located in the vicinity of the Pali Kilo shoreline, but the use of these areas seems rare for the Hawaiian monk seal, having been recorded only three times in the past five years.

5. DISCUSSION

We confirmed that the Pali Kilo nearshore marine resources are consistent with those found similar habitats in Kaneohe Bay and elsewhere on Oahu, Hawaii (Friedlander et al., 2008). Rugosity is low close to the shore, apart from notable channels, and increases with depth. There were only six species of coral observed in the study area, and the community was dominated by only two major reef-building species, *Porites compressa* and *Montipora capitata*. Live coral cover is similar to cover estimates elsewhere in Kaneohe Bay, and our methods likely produced overestimates. Those overestimates are most pronounced in more rugose areas (e.g the channelized strata). The non-coral sessile invertebrate community is comprised of common, widely ranging species for Hawaii. Reef fish are likely utilizing the

shallowest areas as refugia from predators during their juvenile stages, and then emigrate to other areas. The reef fish community was not particularly rich for Hawaiian reefs, where over 400 species are possible. Evaluating biomass would be a valuable metric to include in future surveys, and would help evaluate how fish are using the reef and what pressure the fishery is experiencing from harvest. Algae are an abundant benthic cover, especially in the areas that are channelized. Invasive algae are present and uncontrolled, but may be seasonal and/or limited by environmental variables that were not measured in this resource assessment (e.g. temperature, salinity). Future surveys could be designed to evaluate seasonal effects on invasive algae. The micro-atoll coral morphology is a unique feature to this area, where corals grow very close to the surface of the water, often becoming emergent at the lowest tides.

Fishery Pressure

We observed coral damage in all parts of the study area with the most damage found closest to the shoreline. Being located adjacent to an access point, it is probable that the entire study area is impacted by snorkelers, spearfishers, tako hunters (octopus harvest), and other users. Due to very shallow depths adjacent to the shore, it is likely that users walk, crawl, and/or stand in these areas, possibly causing coral damage. Additionally, it is likely that spearfishers miss their targets, causing minor damage to live corals. However, it is notable that corals with minor damage did not appear to be stressed, and overall health did not appear to be jeopardized. Additionally, the overturned heads of coral found in several locations along the flat and channeled strata, had continued to grow and some of them had coral growing upward, demonstrating recovery. It is likely that tako hunters are responsible for overturning the large coral heads in pursuit of octopus (Bruggemann et al., 2012). Both Spearfishers and tako hunters were frequently observed in the vicinity during our surveys. It is unknown resource use is predominantly related to the Pali Kilo cottages, the Marine Corps Base Hawaii residents, or from nearby local communities. MCBH allows fishing and octopus harvest in the study area. However, MCBH also prohibits damage to coral and live rock.

Recreational Pressure

The deep flat area is unlikely to experience impacts from snorkelers standing, walking, or crawling on the substrate. Where present, corals predominantly grow on the sides of the channels, but not on the upward-facing surfaces. It is unclear if this is due to long term impacts by recreational users (walking on the reef), or as a response to an environmental variable (e.g. light intensity, temperature). Recreational users may walk in the sand channels and impact corals; however, it is unlikely based on low levels of damage observed and tendency for people to walk in the shallowest area available. The entire reef flat study area has a high likelihood of being affected by recreational users because it is adjacent to the Sandy Beach access point and is shallow. Users who enter the water from that location are very likely to walk out on the reef until they reach deeper water.

Recommendations

The marine resources along the Pali Kilo shoreline are currently experiencing coral damage impacts from recreational users. These impacts could possibly be abated through increased direct outreach to users (e.g. requiring base-specific fishing licenses, providing educational programs and printed materials); by placing impact –specific signage at access points for snorkelers, swimmers, bathers, and others; and by

implementing increased enforcement of MCBH regulations in general and in specific areas where impacts are being observed (e.g. Pali Kilo shoreline).

6. REFERENCES

Sustainable Resources Group Intn'l, Inc. (2011) Final Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (MCBH INRMP) (2011-2016). Prepared for Environmental Compliance and Protection Department for Marine Corps Base Hawaii. 160 pp.

Cox, T.E., Foster, K., Sukhraj, N.C., Montgomery, A., Polhemus, D. (2013) Benthic Community and Habitat Maps of Marine Resources at Marine Corps Base Hawaii, Kaneohe Bay, Oahu Island, Hawaii. (2013) Prepared for Marine Corps Base Hawaii. 137 pp.

Battista, T.A., Costa, B.M., and S.M. Anderson, S.M. (2007) Shallow-Water Benthic Habitats of the Main Eight Hawaiian Islands (DVD). NOAA Technical Memorandum NOS NCCOS 61, Biogeography Branch. Silver Spring, MD.

Bruggemann, J.H., Rodier, M., Guillaume, M.M.M., Andréfouët, S., Arfi, R., Cinner, J.E., Pichon, M., Ramahatratra, F., Rasoamanendrika, F., Zinke, J. and McClanahan, T.R. (2012) Wicked Social-Ecological Problems Forcing Unprecedented Change on the Latitudinal Margins of Coral Reefs: the Case of Southwest Madagascar. *Ecology and Society*, 17(4).

Friedlander A.M., Aeby, G., Brainard, R., Brown, E., Chaston, A., Clark, K., McGowan, P., Montgomery, T., Walsh, W., Williams I., and Wiltse, W. (2008) The state of coral reef ecosystems of the Main Hawaiian Islands. In: Waddell J, editor. pp. 219–261. *The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: NOAA Technical Memorandum NOS NCCOS 11*. NOAA/NCCOS Center for coastal monitoring and assessment's biogeography team

Jokiel P.L., Rodgers K.S., Brown E.K., Kenyon J.C., Aeby G., Smith W.R., Farrell F. (2015) Comparison of methods used to estimate coral cover in the Hawaiian Islands. *PeerJ*. 2015 May 12; 3:e954.

7. FIGURES

Figure 1: Reef area potentially impacted by recreational users at Pali Kilo cottages, MCBH



Figure 2: Percent coral cover evaluated by species among strata

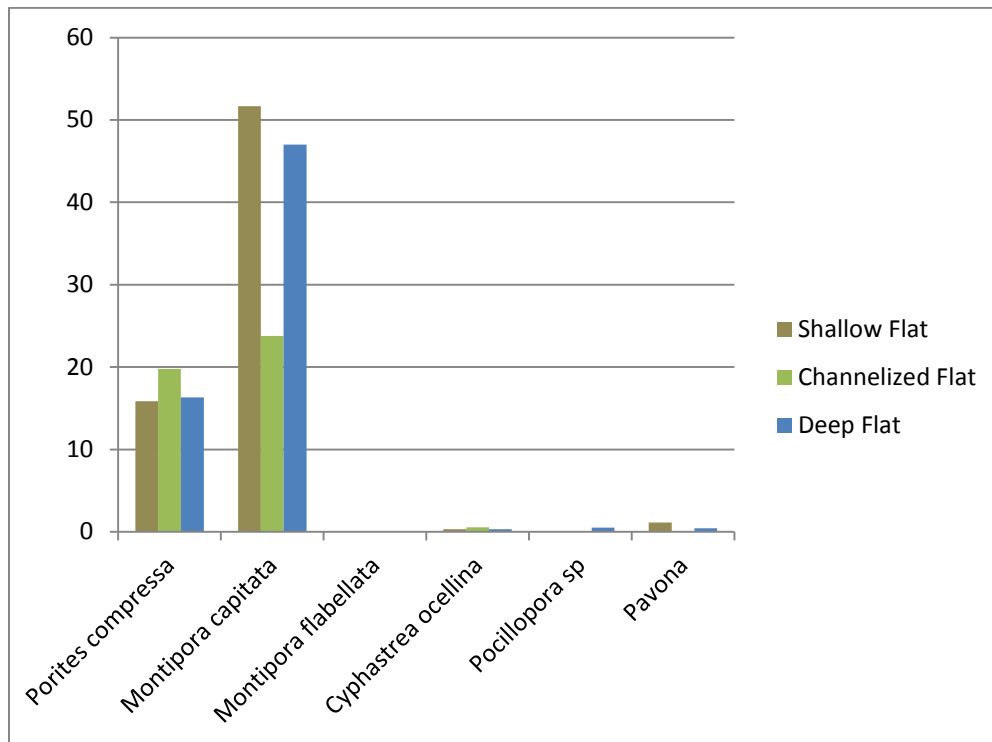


Figure 3: Percent algae cover among strata (macro and turf)

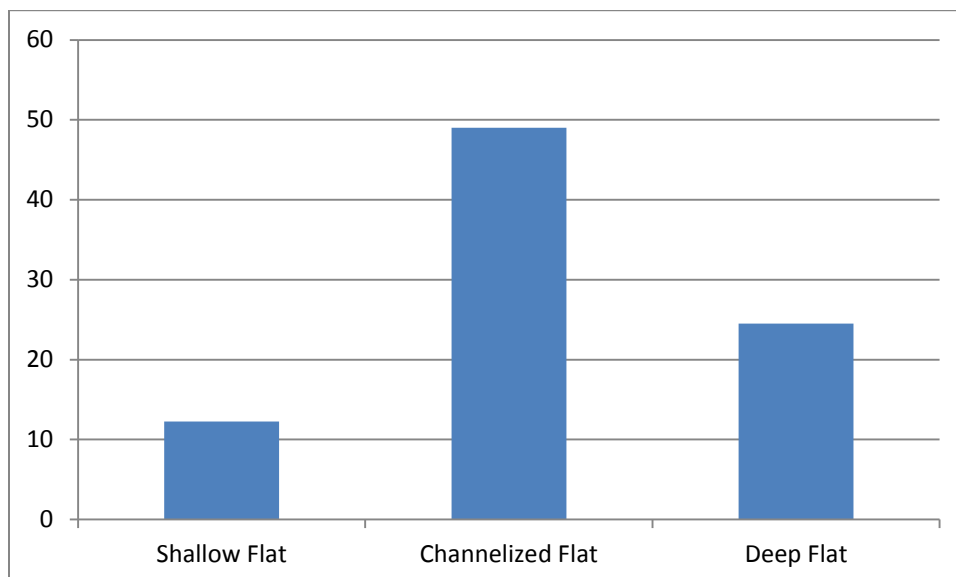
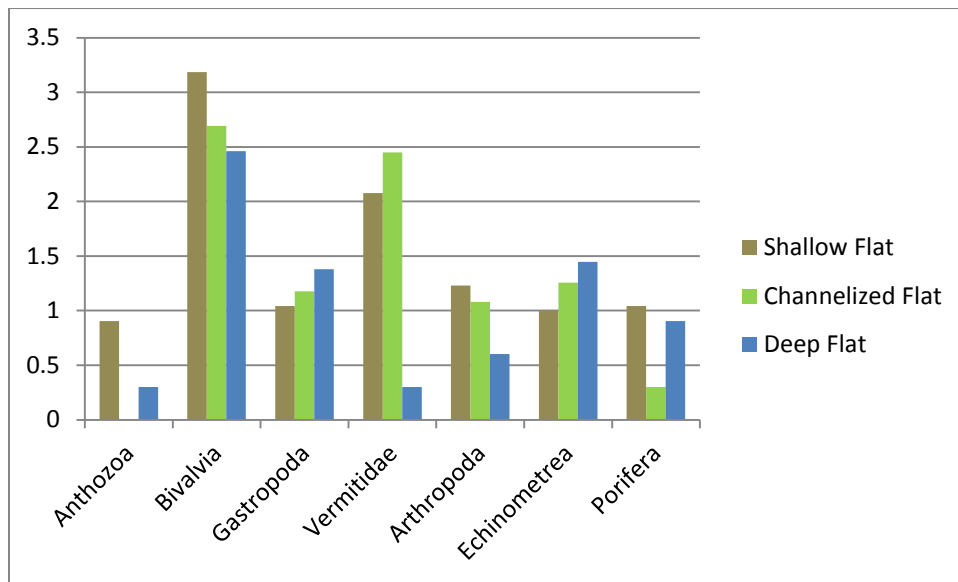


Figure 4: Sessile invertebrate abundance (log transformed) grouped by class among strata



8. TABLES

Table 2: Reef fish abundance grouped by family among strata

Family	Shallow Flat (n=15)	Channelized Flat (n=9)	Deep Flat (n=12)
Parrotfish	625	167	180
Gobies	305	255	83
Surgeonfish	89	46	55
Wrasses	15	9	14
Damselfish	7	10	3
Butterflyfish	10	6	1
Soldierfish	1	1	0
Goatfish	1	1	0
Boxfish	0	0	1
Triggerfish	1	0	0
Lizardfish	0	0	1
Total	1054	495	338
Average	70.3	55.0	28.2

Table 2: Green sea turtle haul outs reported at MCBH, 2011-2015

Year	Number of Haul Outs	
	Recorded	Beach Locations and Number of Cases
2011	2	Pyramid Rock (1), North Beach (1)
2012	0	-
2013	2	Ft. Hase (1), North Beach (1)
2014	4	Pyramid Rock (1), North Beach (1), Waterfront Ops Boat Ramp (1)
2015*	0	-
* Data from 2015 is from January 1 st to April 15 th only.		

Table 3: Hawaiian monk seal haul outs reported at MCBH, 2004-2015

Year	Number of Haul Outs	
	Recorded	Beach Locations and Number of Cases
2004	9	Not recorded (4), Pyramid Rock (3), North Beach (2)
2005	3	North Beach (2), Ft. Hase (1)
2007	6	Not recorded (4), North Beach (2), Ft. Hase (1), Pyramid Rock (1)
2008	8	Cabins beach (4) , Not recorded (3), North Beach (1)
2009	9	North Beach (4), Ft. Hase (2), Pyramid Rock (2), Not recorded (1)
2010	6	Pyramid Rock (3), Ft. Hase (2), North Beach (1)
2011	30	Pyramid Rock (14), Ulupau Cove (5), North Beach (5), Hilltop (3), Kii Point (2), Ft. Hase (1)
2012	17	Ft. Hase (5), Pyramid Rock (4), Cottage Cove (2) , Hale Koa (2), Hilltop (2), North Beach (2)
2013	22	North Beach (12), Pyramid Rock (5), Ft. Hase (2), Hilltop (1), NCO Cottage/Seabee Cottage (1) , Ulupau Cove
2014	8	North Beach (4), Pyramid Rock (2), Ft. Hase (1), Hilltop (1)
2015*	3	Pyramid Rock (3)

* Data from 2015 is from January 1st to April 15th only.

Bolded text is for haul outs along the Pali Kilo coastline fronting the project area.

Data from 2004 to 2009 are from the National Marine Fisheries Service.

9. APPENDICES

Appendix A: Randomly selected transect sites (GPS coordinates)

Transect Site	Latitude	Longitude
C1	157.767760	21.457710
C2	157.767050	21.458360
C3	157.768230	21.456810
C4	157.768232	21.457172
C5	157.768260	21.456960
C6	157.768351	21.456916
C7	157.767226	21.458423
C8	157.766720	21.458500
C9	157.766721	21.458502
D1	157.768640	21.457810
D2	157.769170	21.457422
D3	157.767290	21.456600
D4	157.767030	21.458530
D5	157.768400	21.458070
D6	157.768057	21.458388
D7	157.767469	21.458457
D8	157.768914	21.457426
D9	157.768909	21.457713
D10	157.768746	21.457962
D11	157.767649	21.458204
D12	157.768008	21.457873
F1	157.768490	21.456680
F2	157.769650	21.457010
F3	157.768620	21.457540
F4	157.768910	21.456690
F5	157.769140	21.456810
F6	157.768057	21.458388
F7	157.767469	21.458457
F8	157.769340	21.457190
F9	157.768909	21.457713
F10	157.768746	21.457962
F11	157.767649	21.458204
F12	157.768008	21.457873
F13	157.768767	21.457443
F14	157.767962	21.458449
F15	157.766683	21.458611

Appendix B: Representative Photos of Strata

Photo 1: Representative 1-meter quadrats in the Channel strata

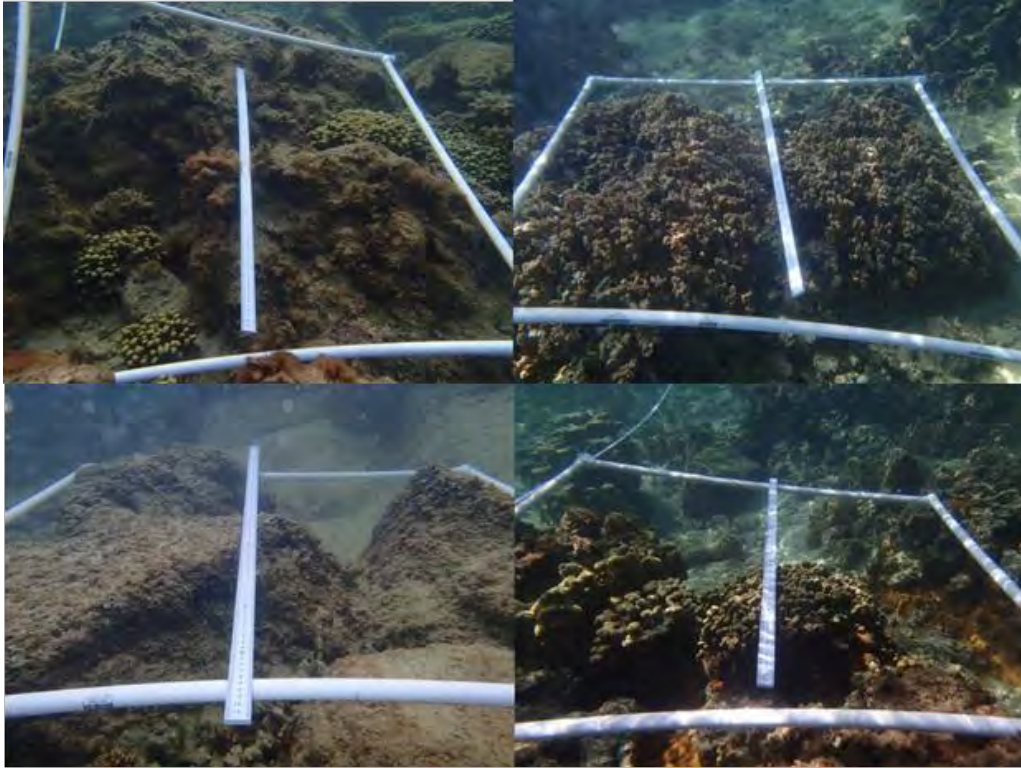


Photo 2: Representative 1-meter quadrats in the Deep strata

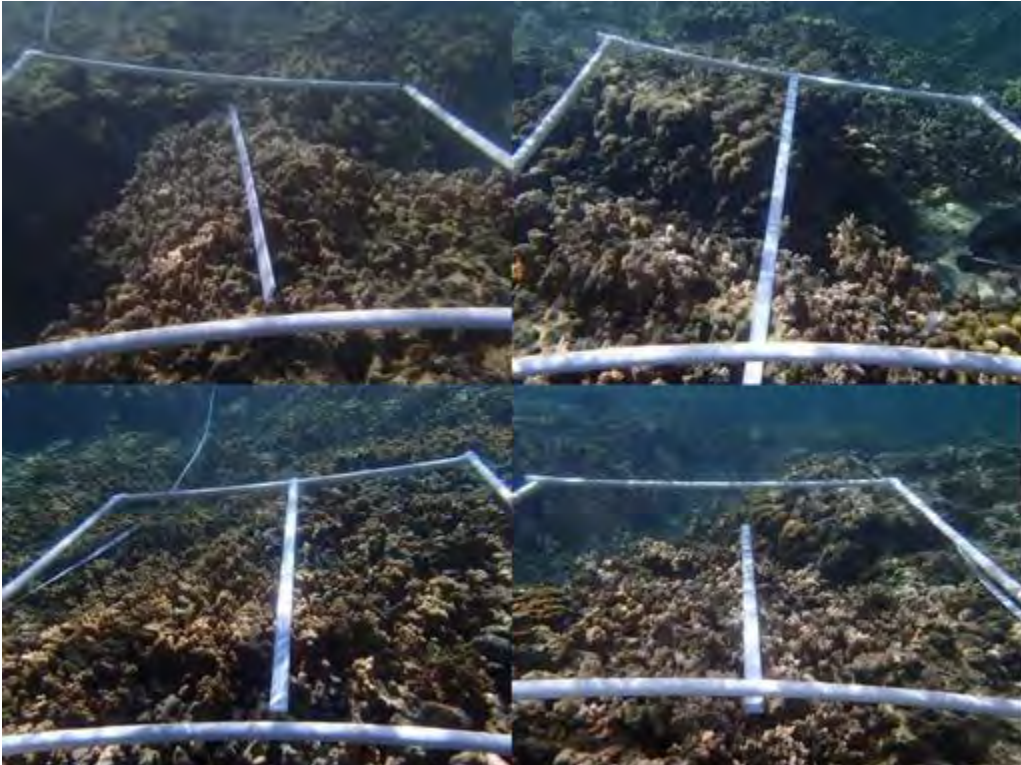
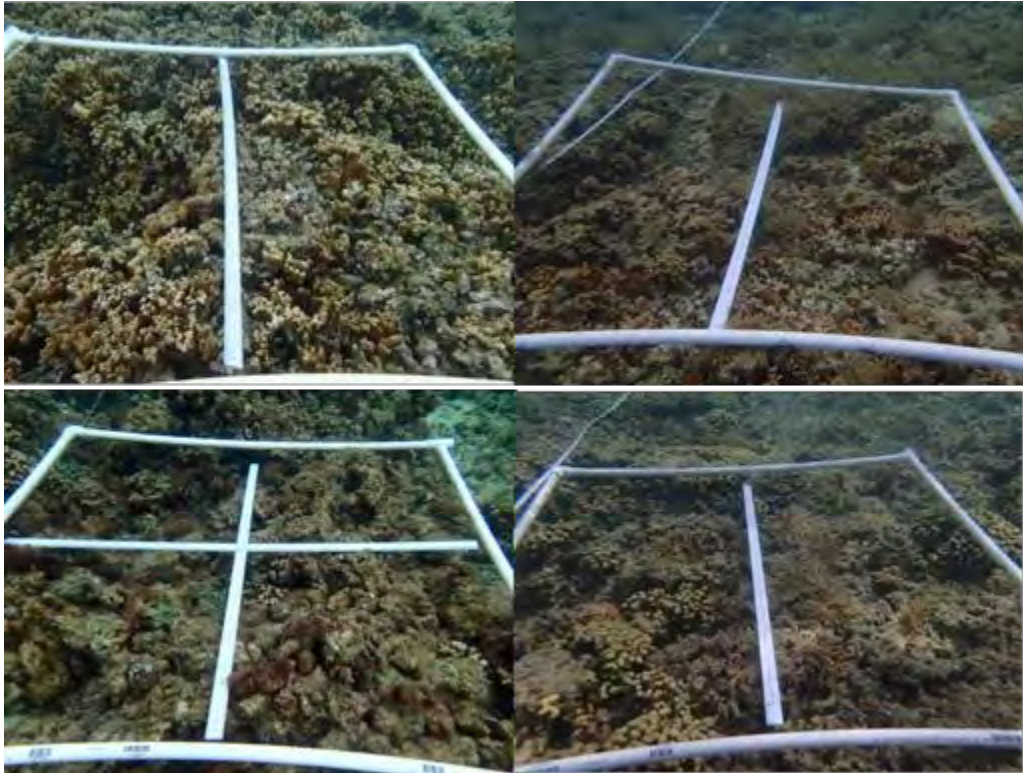


Photo 3: Representative 1-meter quadrats in the Flat strata



Appendix C: Raw Data

Quadrat data - Coral

SPECIES	Porites compressa	Montipora capitata	Montipora flabellata	Cyphastrea ocellina	Pocillopora sp	Pavona
SITE						
C1	7	18				
C2	10	2				
C3		27				
C4	45					
C5	22	18				x
C6	35	20			x	
C7	22	95		4		
C8	2	24		1		
C9	35	10		x		
D1	11	80				
D2	30	35				x
D3	10	25			1	
D4		10			x	
D5	30	15			5	
D6	50	1		x		
D7	10	110		x	x	
D8		30		x	x	5
D9	8	x		3		
D10	x	160		x	x	
D11	45	90		1		x
D12	2	8	x			
S1	10	2				
S2		6				
S3	40	140				x
S4	x	105				
S5	35	50				
S6	13	5			x	7
S7	15	5			x	1
S8	10	105				1
S9	5	50		1		
S10	x	52				
S11	25	50				
S12	35	x		2	x	
S13	x	45		1	x	x
S14	5	160		1		
S15	45	x			d	8

S6		5	x	5		1	20		x	x	10		6		x	60
S7	83						10				2		x	2	1	x
S8		1	1			x	10	x		x	x		1	x	25	x
S9	x		6				1			x						48
S10	3						2			x						63
S11							1			x			1			30
S12		x			30		6	x	2	21	x		6		5	1
S13	x	x				x	3	1	2		x	3	1	2	1	40
S14	x								1		x			11	10	
S15	x	1					11	x	x		x		5	10	x	

Algae Codes

CODE	SPECIES	CODE	SPECIES
1A	Acanthophora spicifera	1T	grn leaf
1B	actinotrichia?	1U	Halimeda
1C	Acrosymphyton taylorii	1V	Haloplegma duperreyi
1D	Asparagopsis taxiformiss	1W	Hydrolithon onkodes
1E	Bangia atropurpurea	1X	Laurencia
1F	bl gr	1Y	Lobophora variegata
1G	black bubbly algae	1Z	Lyngbya majuscula
1H	bik or brn tuft	2A	misc
1I	brown leaf	2B	Neomeris annulata
1J	brn grn leaf	2C	orange branch
1K	Caulerpa serrulata	2D	Padina
1L	Caulerpa macrophyea	2E	red fluff
1M	Cladophora vegabunda	2F	Red leafy bush
1N	Dictyosphaeria sp	2G	Sphacelaria sp
1O	Dictyota acutiloba	2H	Turbinaria ornata
P	Dictyota sp	2I	turf
1Q	Galaxaura rugosa	2J	Ventricaria ventricosa
1R	Gracilaria salicornia	2K	ylw brn tuft

Quadrat data – other macroinvertebrates

INVERT CODE	2K	2L	2M	2N	2O	2P	2Q	2R	2S	2T	2U	2V	2W	2X	2Y	2Z	3A	3B	3C	3D	3E	3F	3G	3H	3I	3J	3K
SITE																											
C1			1									1								1	1	1					
C2								1																			
C3				100+			1	1	4			30		1	2					4							x
C4				100+				1		x											1						
C5		x	40				2					130			1					1	3						
C6			80	10+			1			1		120		1	1					2	2						
C7						1		2						3						1							
C8			2	100										1	1			1									
C9				x				1											1						x		x
D1							3	1											1		2						
D2		++																						1			x
D3					1			2													1						
D4					1			3																			
D5							1	1				1			1			1				1		2			x
D6																				4		1					x
D7				x																		2			1		x
D8	x		1	50				8																			
D9				10+				1						1						10					x		x
D10				20								1															x
D11				100+																							x
D12				60				2								1				1		1					x
S1		x	15									1			1												
S2																											
S3				1										1													1

Fish Data

FISH CODE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	
SITE																													
C1							106	1								2	5												
C2			1			8	2							3		6	1					3	1	1	1		1		
C3						2	48																						
C4							31																						
C5						4	23									40						1							
C6						10	39									100						1							
C7						8	5							2		9		3	5cm			1							
C8						5			1							10		1		1									
C9						8																1							
D1					1	3	21									70							2						
D2						3	3																						
D3							4																2						
D4							4																						
D5	1					2	4											2											
D6						6	2													1	1	4				1			
D7			1							2																			
D8							4											1											
D9						5	4									20								1					
D10				2		1	9																						
D11						23	4									70													
D12						7	21	1		1					20							3						1	
S1							57																						
S2							51																						
S3						18	2			2	1	1	1			130	3				1	1					1		
S4																													

S5		4	30			10	2	1	
S6		7				20			
S7		7		1		30		1	1
S8	1	12	22			70		1	1
S9		8	26	1	1	150	2	2	1
S10			23	1					
S11		3	35	5					
S12		15	2	4		5	100	3	
S13		2	6			20		1	1
S14		5	11	1	2	90			
S15		7	16						

Fish Codes

A	Acanthurus achilles	P	Scarus psittacus
B	Acanthurus nigroris?	Q	Abeduduf abdominalis
C	Acanthurus sp	R	chromis
D	Acanthurus sp (dark w stripe on tail)	S	Dascyllus albisella
E	Acanthurus sp (striped)	T	Gomphosus varius
F	Acanthurus triostegus	U	Stethojulis belteata?
G	Asterropteryx semipunctatus	V	Thalossoma duperrey
H	Psilogobius mainlandi	W	Thalossoma trilobatum
I	Chaetodon (ylw on top white on bottom, 1 spot top back	X	Myripristis sp
J	Chaetodon auriga	Y	Ostracion meleagris
K	Chaetodon lunula	Z	Parupeneus sp
L	Chaetodon lunulatus	AA	Rhinecanthus rectangulus
M	Chaetodon sp	BB	Synodus sp
N	Chaetodon unimaculatus		
O	Chlorurus spilurus		

Appendix C
ESA Section 7 and EFH Consultation

EFH Documentation





DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING COMMAND, PACIFIC
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HAWAII 96860-3134

5090P.1F13B
Ser EV2/0039
25 January 2016

Mr. Michael Tosatto
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-4700

Dear Mr. Tosatto:

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR
THE PROPOSED EXPANSION AND OPERATION OF THE PALI KILO
BEACH COTTAGES AT MARINE CORPS BASE HAWAII, KANEOHE BAY,
OAHU, HAWAII

Pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 USC § 1531 et seq.), the Navy requests informal consultation with the National Marine Fisheries Service (NMFS) regarding the proposed expansion and operation of the Pali Kilo Cottages at Marine Corps Base Hawaii (MCB Hawaii), Kaneohe Bay. The action area includes the construction footprint (impact area) and the nearshore marine environment along the Pali Kilo coastline.

We have determined that species in the action area that are listed pursuant to the Endangered Species Act (ESA) are the threatened green sea turtle (*Chelonia mydas*), endangered Hawaiian monk seal (*Monachus schauinslandi*), and the endangered hawksbill sea turtle (*Eretmochelys imbricata*). Please let us know if there are other listed or proposed species in the project area that may be affected that we have not considered.

This letter also requests consultation to fulfill Navy's requirements to consider the impacts of its actions on Essential Fish Habitat (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.).

A full description and analysis of the proposed action, the action area, and impacts and findings for ESA species and EFH is provided in enclosure (1): Biological Evaluation for the Proposed Expansion of The Pali Kilo Cottages, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii

Summary of the Proposed Action:

Naval Facilities Engineering Command Pacific (NAVFACPAC) is preparing an Environmental Assessment (EA) for Marine Corps Community Services (MCCS), which proposes to increase the number of recreational beach cottages at MCB Hawaii, Kaneohe Bay, in order to accommodate additional guests, meet the existing and future needs of guests, and

The proposed action consists of constructing up to 49 new recreational cottages along the Pali Kilo area of the Mokapu Peninsula at MCB Hawaii, Kaneohe Bay (supplementing the existing 14 lodging units). More specifically, 19 separate single or duplex cottages (35 cottage units) would be constructed, along with a 14 unit Efficiency Unit complex.

Description of the Action Area:

The recreational cottages are situated along a coastal reach referred to as Pali Kilo within MCB Hawaii Kaneohe Bay. This is located on the western edge of Mokapu Peninsula in the Heeia ahupuaa within the Koolau Poko District of Oahu. This coastal area is bordered by Palikilo Road to the east, and the shoreline of Kaneohe Bay to the west that extends northward to the geological feature known as Kuau or Pyramid Rock.

The impact area for the action alternatives includes the area from the shoreline inland to Palikilo Road and Mokapu Road, and from Building 1304 (near south beach cove) north up to Building 1607 (Presidential Cottage). This project area encompasses about 16.8 terrestrial acres. This area can be described as being somewhat rural in character with a predominantly rocky coastline. The shoreline also has a few small pocket beaches, as well as a small cove to the south (south beach cove) on the southern extent.

Also included in the action area are the nearshore marine resources along the Pali Kilo shoreline seaward of where proposed construction would occur, because it is possible that additional lodging may increase recreational use of the nearshore marine environment. Therefore, a portion of marine habitat adjacent to the impact footprint has been included in the action area. It is expected that BMPs and Conservation Measures found in Sections 6 and 7 of the Biological Evaluation will entirely mitigate direct and indirect impacts, and sufficiently reduce adverse effects to Essential Fish Habitat from recreational activities.

Summary of impacts and findings for ESA species:

Direct impacts related to the construction of the new cottage and efficiency units include impacts from human presence, disturbance from construction noise, and exposure to sedimentation, wastes, and discharges. Some construction activities may be far enough away from the shoreline and/or have topographic features that block direct effects from construction related activities. Additionally, construction-related impacts will be mitigated through extensive best management practices. Indirect effects that could occur post-construction include disturbance from increased human recreational activities on the Pali Kilo shoreline and in the marine environment as a result of recreation activities from cottage users. These effects can be mitigated through extensive outreach and education of cottage users.

The Navy requests your concurrence with our determination that the proposed action *may affect but is not likely to adversely affect the ESA species listed above, because the effects, if any, will be discountable*. The project impacts will be insignificant in scope and duration and no taking of any listed species is expected. Additionally, there is no critical habitat designated within the action area. As such, a formal consultation will not be required.

Summary of impacts and findings EFH:

The impact area of the proposed project is terrestrial; however future impacts to essential fish habitat are possible as a result of increased recreation activity in the nearshore marine environment as a result of this action. However, the Navy has determined that *the proposed project may affect EFH, but effects will be minimal and insignificant, because steps can be taken to minimize and avoid adverse effects on EFH.* Negative effects to EFH can be mitigated through cooperative education and outreach programs implemented by MCCS and MCB Hawaii.

Thank you for your consideration of our request for your review and concurrence. Should you have any questions or other concerns, please contact Ian Lundgren, Natural Resources Management Specialist for coral reefs on my staff at (808) 472-1426 or ian.f.lundgren@navy.mil.

Sincerely,



KAREN SUMIDA
Business Line Manager
Environmental

- Enclosure: 1. Biological Evaluation and Essential Fish Habitat Assessment, The Cottages at Kaneohe Bay Expansion Project, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii
- Enclosure: 2. Baseline Assessment of Marine Resources Near The Cottages at Kaneohe Bay, Marine Corps Base Hawaii April 2015



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

Karen Sumida
Department of the Navy
Naval Facilities Engineering Command, Pacific
258 Makalapa Dr., STE, 100
Pearl Harbor, Hawaii 96860

February 26, 2015

Dear Ms. Sumida:

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) has reviewed the Department of the Navy (Navy) January 25, 2016 Essential Fish Habitat (EFH) consultation request and enclosed January 12, 2016 Biological Evaluation for the proposed expansion and operation of the Pali Kilo Beach Cottages at the Marine Corps Base Hawaii (MCBH) located in Kaneohe Bay, Oahu, Hawaii. We have also reviewed the enclosed April 2015 Marine Resources Baseline Assessment.

The Proposed Action consists of constructing up to 19 new recreational cottages along the Pali Kilo area of the Mokapu Peninsula at MCBH. This would supplement the existing 14 cottages in the area that are operated by Marine Corps Community Services (MCCS). There will be a total of 35 units in these 19 separate single or duplex cottages and 14 studio units together in a single "Efficiency Unit" (EU) complex. The EU will be located at the site of an existing Building 1180, which would be demolished and relocated to another location in the southern part of the MCBH. The coastal area where the new units would be constructed is located immediately adjacent to Kaneohe Bay, specifically the Pali Kilo cove. The equipment, machinery, materials and construction methods to be used have not been specified, also not the project duration or anticipated start date.

NMFS greatly appreciates Navy's efforts to coordinate with us early and often on this proposed action, and in collecting and providing marine biological data from the Pali Kilo cove located adjacent to the construction site. We agree that with a combined effort by the Navy, MCCS and MCBH in implementing the proposed Best Management Practices (BMPs), conservation measures and our EFH conservation recommendations, the proposed



action will likely have minimal adverse effects on EFH. We offer the following comments in accordance with the EFH provision of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (50 C.F.R. § 600.905 – 930).

Magnuson-Stevens Act

Pursuant to the Magnuson-Stevens Act, the Secretary of Commerce, through NMFS, is responsible for the conservation and management of fishery resources found off the coasts of the United States. *See* 16 U.S.C. 1801 *et seq.* Section 1855(b)(2) of the Magnuson Act requires federal agencies to consult with NMFS with respect to “any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act.” The statute defines EFH as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity.” 16 U.S.C. 1802(10). Adverse effects on EFH are defined further as “any impact that reduces the quality and/or quantity of EFH,” and may include “site-specific or habitat-wide impacts, including individual, cumulative or synergistic consequences of actions.” 50 C.F.R. § 600.810(a). The consultation process allows NMFS to make a determination of the project's effects on EFH and provide Conservation Recommendations to the lead agency on actions that would adversely affect such habitat. *See* 16 U.S.C. 1855(b)(4)(A).

Essential Fish Habitat

The marine water column and seafloor in Kaneohe Bay including the Pali Kilo cove have been designated as EFH that supports various life stages of management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council’s Pelagic and Hawaii Archipelago Fishery Ecosystem Plans (FEPs). The MUS and life stages found in these waters include: eggs, larvae, juveniles and adults of Coral Reef Ecosystem MUS (CRE-MUS); eggs, larvae, juveniles and adults of Bottomfish MUS (BMUS); eggs, larvae, juveniles and adults of Crustacean MUS (CMUS); and juveniles and adults of Pelagic MUS (PMUS). In addition, Kaneohe Bay has been designated as an EFH Habitat Area of Particular Concern (HAPC) for CRE-MUS.

The Biological Evaluation and Marine Resources Baseline Assessment indicate that the Pali Kilo Cove, which is located immediately adjacent (downhill) to the construction site for the cottages, consists of a channel, deep flat and shallow reef flat. The cove is generally very shallow with water depth ranging from approximately 1 foot (ft) to several feet. The coral community structure in the Cove is similar to other reef flats in Kaneohe Bay, however is unique in consisting of an abundance of large corals of a micro-atoll morphology not commonly found in shallow waters. Six (6) species of corals were observed in the Cove of which *Porites compressa* and *Montipora capitata* account for 98%. Percent coral cover ranges from 22% to 35%. The non-coral sessile invertebrate community is comprised of common, widely ranging species for Hawaii. Although algae were present at all sites,

extensive growth onto healthy/live coral was not prevalent. 18 species of reef fish were recorded with surgeonfish, butterflyfish, and damselfish the most common and speciose.

Surveys observed coral damage in all parts of the study area with the most damage found closest to the shoreline: damage to coral in more than 50% of the transect sites surveyed in the shallow flat within the cove; 33% transects with minor damage, and 20% sites with large coral heads broken and turned over. This damage is attributed largely to direct abrasion by snorkelers, spearfishers, tako hunters (octopus harvest), and other users due to the very shallow depths in the cove and its location adjacent to a Sandy Beach access point.

NMFS determines that adverse effects on EFH from the proposed action may occur from: i) storm-water run-off induced sedimentation and turbidity effects to invertebrates and fish in the cove during construction of the cottages; ii) storm-water run-off induced sedimentation and turbidity effects to invertebrates and fish in the cove post-construction from addition of impervious surfaces in the area and increased erosion due to increased land-use from cottage users; iii) increased abrasion to corals in the cove due to the greater number of snorkelers, swimmers, kayakers, paddle-boarders and fishers visiting the Cove; and iv) increased abrasion to corals in other parts of Kaneohe Bay due to a greater number of snorkelers, swimmers, kayakers, paddle-boarders, fishers and pontoon-boaters visiting the Bay. We agree with Navy's analysis that these adverse impacts to EFH can be avoided given a concerted, combined and continuous effort by the Navy, MCCA and MCBH in implementing a range of construction-related BMPs and conservation measures.

NMFS provides the following conservation recommendations to ensure that adverse effects to EFH including coral reef resources are avoided, minimized and offset.

EFH Conservation Recommendations

1. Develop a plan to ensure that each of the proposed construction-related BMPs and 7 conservation measures relevant to protecting EFH as listed on pages 20-21 in the Biological Evaluation are effectively implemented not only throughout the construction period, but post-construction for the entire duration that the cottages bring additional visitors to MCBH.
2. Contain storm water on land at the project site to avoid storm-water run-off carrying pollutants including sediment to the Pali Kilo cove both during and post-construction. For example:
 - a. Control land-side erosion that may be related to development of social trails from cottages to the shoreline. Consider directing visitors to use pre-determined paths that are strategically constructed and sited to avoid acting as conduits for storm-water discharge to the ocean, and/or strategically locate native vegetational and/or structural barriers between cottage and shoreline where cottage users will likely create paths to access ocean.
 - b. Ensure that construction staging area(s) does not generate any contaminants.

- c. Avoid scheduling construction of cottages during the rainy-season. In the event of an out of season or unusually heavy rain event, cease work and ensure additional storm water control measures are put in place as necessary to contain sediment run-off to ocean.
 - d. Heavily implement Low Impact Development measures throughout the cottage development landscape. This would include limiting the area of impervious surfaces, and upgrading drainage systems to handle additional run-off.
- 3. Implement measures to discourage and prohibit recreational behaviors and practices in the cove that cause abrasion to corals and generally impact the marine resources within the cove. For example:
 - a. Develop and implement check-in orientations with cottage-users on the marine resources in the Bay and cove and explain in person how visitors should recreate without impacting the marine resources.
 - b. Re-enforce the information provided during the orientation by developing and implementing signs and outreach materials. These materials should present simple and clear messaging and could include messages such as “step only on sand”, “look only, do not touch”, “avoid contact with corals, they sting”, “sunscreen can damage corals” etc.
 - c. Create a designated launch area at the beach where kayakers and paddle-boarders are to enter and exit the water. This would be sited where there is some depth and primarily sand bottom.
 - d. Consider designating areas in the cove for different types of activities. For example, encourage walking and water-play where the bottom is dominated by sand/rubble in the area immediately adjacent to the beach by the main beach access, and encourage kayakers and paddle-boarders to use mainly the deeper areas in the cove. Consider using buoys as markers for designated areas.
 - e. Explore options for discouraging swimmers, spear fisherman, kayakers, paddle-boarders from venturing out over the reef flat at very low tides. For example, consider installation of a water-depth gauge by the paddle launch area with tidal ranges translated to when it’s “safe” to venture across the reef versus not.
 - f. Promote use of other beaches and areas on MCBH harboring less sensitive resources.
 - g. Control proximity of vehicles to shoreline at the main beach access, e.g. place boulders and/or re-vegetate area under trees by access point to discontinue parking immediately adjacent to the beach.
- 4. MCCS should develop and implement a long-term plan to monitor unauthorized and unacceptable recreational behavior by cottages users. This should involve searching for corals drying at a cottage and reporting it to law enforcement or MCCS Cottage management, monitoring for rubbish along the beach and removing it, and generally observing cottage users to ensure they are following the rules.

5. Determine whether there may be impacts to other areas within Kaneohe Bay associated with increased numbers of visitors at the cottages. For example, determine if a larger number of pontoon boats will be rented from the Marina and if so, what impacts if any will be associated with this boating. If findings indicate that recreational boating associated with the MCBH causes injury to corals in the Bay due to unintentional reef groundings, actively work to influence better boating practices.

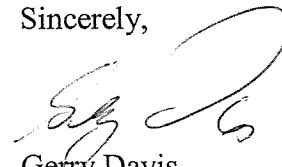
Please be advised that regulations (Section 305(b)(4)(B) of the MSA) to implement the EFH provisions of the MSA require that Federal action agencies provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. The final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with our EFH Conservation Recommendations, an explanation of the reason for not implementing the recommendations must be provided.

Conclusion

In conclusion, NMFS greatly appreciates Navy's efforts to consult with us early and often, in providing us in-depth marine biological information from the project area, and in proposing multiple measures to mitigate adverse affect to EFH including coral reef resources from the proposed action. We agree with Navy's determination that adverse effects to EFH will likely be minimal given a concerted, combined and continuous effort by the Navy, MCCA and MCBH in implementing the proposed construction-related BMPs and EFH focused conservation measures including our EFH Conservation Recommendations.

Please do not hesitate to contact Danielle Jayewardene at 808-725-5088 (danielle.jayewardene@noaa.gov) with any comments, questions or to request further technical assistance.

Sincerely,



Gerry Davis

Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:

Ian Lundgren, Navy
Lance Bookless, MCBH
Kevin Foster, US FWS
Wendy Wiltse, US EPA
Brain Neilson, HI-DLNR DAR



DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, PACIFIC
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HAWAII 96860-3134

5090P.1F13B
Ser EV2/00167
31 Mar 2016

Mr. Michael Tosatto
Regional Administrator
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Islands Regional Office
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

Dear Mr. Tosatto:

**SUBJECT: ESSENTIAL FISH HABITAT ASSESSMENT FOR THE PROPOSED
EXPANSION AND OPERATION OF THE PALI KILO BEACH COTTAGES AT
MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII**

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.) (MSA) and regulations governing conservation of Essential Fish Habitat (EFH), the Navy is providing this letter as a response to National Marine Fisheries Service's (NMFS's) 29 February 2016 letter with conservation recommendations for the proposed expansion and operation of The Pali Kilo Cottages at Marine Corps Base Hawaii (MCBH), Kaneohe Bay. Although the impacts from the project can be minimized through implementation of Best Management Practices (BMPs) that will be implemented during construction and operation and Conservation Measures included in the proposed action, the Navy provides responses to Conservation Recommendations from NMFS below. As noted in NMFS's letter, the Conservation Recommendations are pursuant to the MSA and the Fish and Wildlife Coordination Act (16 USC § 662).

The Navy's responses to the five (5) EFH conservation recommendations offered in your letter received 29 February 2016 (dated 26 February 2015) pursuant to section 305(b)(4)(A) of the MSA are:

NMFS EFH Conservation Recommendation 1: Develop a plan to ensure that each of the proposed construction-related BMPs and 7 conservation measures relevant to protecting EFH as listed on pages 20-21 in the Biological Evaluation are effectively implemented not only throughout the construction period, but post-construction for the entire duration that the cottages bring additional visitors to MCBH.

Navy response to Conservation Recommendation 1: The Navy agrees to develop a plan that ensures each of the construction-related BMPs and 7 conservation measures relevant to

protect EFH as listed on pages 20-21 in the Biological Evaluation. This plan will be implemented not only throughout the construction period, but post-construction for the entire duration that the cottages bring additional visitors to MCBH. The “Essential Fish Habitat Protection Plan” will be put in place in the MCCS Request for Proposal (RFP), which will be used to award the design/build contract for this project.

NMFS EFH Conservation Recommendation 2: Contain storm water on land at the project site to avoid storm-water run-off carrying pollutants including sediment to the Pali Kilo cove both during and post construction. For example:

- a. Control land-side erosion that may be related to development of social trails from cottages to the shoreline. Consider directing visitors to use predetermined paths that are strategically constructed and sited to avoid acting as conduits for storm-water discharge to the ocean, and/or strategically locate native vegetational and/or structural barriers between cottage and shoreline where cottage users will likely create paths to access ocean.
- b. Ensure that construction staging area(s) does not generate any contaminants.
- c. Avoid scheduling construction of cottages during the rainy-season. In the event of an out of season or unusually heavy rain event, cease work and ensure additional storm water control measures are put in place as necessary to contain sediment run-off to ocean.
- d. Heavily implement Low Impact Development measures throughout the cottage development landscape. This would include limiting the area of impervious surfaces, and upgrading drainage systems to handle additional run-off.

Navy response to Conservation Recommendation 2: The Navy agrees that managing storm water run-off is essential to the ecological sustainability of EFH, and this will be reflected in the Environmental Assessment for this project. MCBH Environmental Department will advise the Cottages Operator Marine Corps Community Services Hawaii (MCCS) where predetermined paths should be situated and which optimal construction strategies should be included in the landscape design of the project implementation. Contaminant management is included as a BMP referenced in Conservation Recommendation 1. Avoiding construction during the rainy season and implementing Low Impact Development measures will be requirements stipulated in the MCCS Request for Proposal (RFP) and included as requisites in the final design/build contract.

NMFS EFH Conservation Recommendation 3: Implement measures to discourage and prohibit recreational behaviors and practices in the cove that cause abrasion to corals and generally impact the marine resources within the cove. For example:

- a. Develop and implement check-in orientations with cottage-users on the marine resources in the Bay and cove and explain in person how visitors should recreate without impacting the marine resources.

- b. Re-enforce the information provided during the orientation by developing and implementing signs and outreach materials. These materials should present simple and clear messaging and could include messages such as "step only on sand," "look only, do not touch," "avoid contact with corals, they sting," "sunscreen can damage corals," etc.
- c. Create a designated launch area at the beach where kayakers and paddle-boarders are to enter and exit the water. This would be sited where there is some depth and primarily sand bottom.
- d. Consider designating areas in the cove for different types of activities. For example, encourage walking and water-play where the bottom is dominated by sand/rubble in the area immediately adjacent to the beach by the main beach access, and encourage kayakers and paddle-boarders to use mainly the deeper areas in the cove. Consider using buoys as markers for designated areas.
- e. Explore options for discouraging swimmers, spear fisherman, kayakers, paddle-boarders from venturing out over the reef flat at very low tides. For example, consider installation of a water-depth gauge by the paddle launch area with tidal ranges translated to when it's "safe" to venture across the reef versus not.
- f. Promote use of other beaches and areas on MCBH harboring less sensitive resources.
- g. Control proximity of vehicles to shoreline at the main beach access (e.g., place boulders and/or re-vegetate area under trees by access point to discontinue parking immediately adjacent to the beach).

Navy response to Conservation Recommendation 3: The Navy agrees that long-term EFH protection is a priority and will seek the guidance of NMFS and MCBH Environmental Department in determining the final package of measures and guidance for Cottage users related to responsible recreational behaviors. The Navy agrees that the recommendations a.-g. (above) is a good list to begin with but that additional measures and guidance maybe useful in ensuring responsible resource management. Navy looks forward to continue collaboration in this respect.

NMFS EFH Conservation Recommendation 4: MCCA should develop and implement a long-term plan to monitor unauthorized and unacceptable recreational behavior by cottages users. This should involve searching for corals drying at a cottage and reporting it to law enforcement or MCCA Cottage management, monitoring for rubbish along the beach and removing it, and generally observing cottage users to ensure they are following the rules.

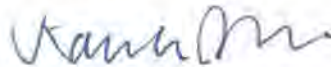
Navy response to Conservation Recommendation 4: The Navy will have literature informing guests that the taking of live or dead coral is against State law, and will ensure that these notices continue to be issued at guest check-in. Laborers will patrol grounds at least once a day for removal of rubbish along all cottage areas and will be instructed to report all unauthorized and unacceptable recreational behavior to law enforcement or MCCA Cottage management.

NMFS EFH Conservation Recommendation 5: Determine whether there may be impacts to other areas within Kaneohe Bay associated with increased numbers of visitors at the cottages. For example, determine if a larger number of pontoon boats will be rented from the Marina and if so, what impacts if any will be associated with this boating. If findings indicate that recreational boating associated with the MCBH causes injury to corals in the Bay due to unintentional reef groundings, actively work to influence better boating practices.

Navy response to Conservation Recommendation 5: The Navy will conduct a survey through Marina Operations on pontoon boat rentals by guests residing at the cottages and will track the trends of reported boat groundings. Additionally, the Outdoor Recreational Center will be an ideal location to interact with a more general audience of users (not limited to Cottage guests) in order to increase coral reef awareness and further safeguard the EFH in Kaneohe Bay through dissemination of outreach materials developed in association with this proposed project.

We appreciate the time and careful consideration that went into evaluating the proposed project and providing EFH conservation recommendations. Should you have any questions about the Navy's response, please contact Mr. Ian Lundgren of our Environmental Planning and Conservation Product Line at phone (808) 472-1426 or e-mail ian.f.lundgren@navy.mil.

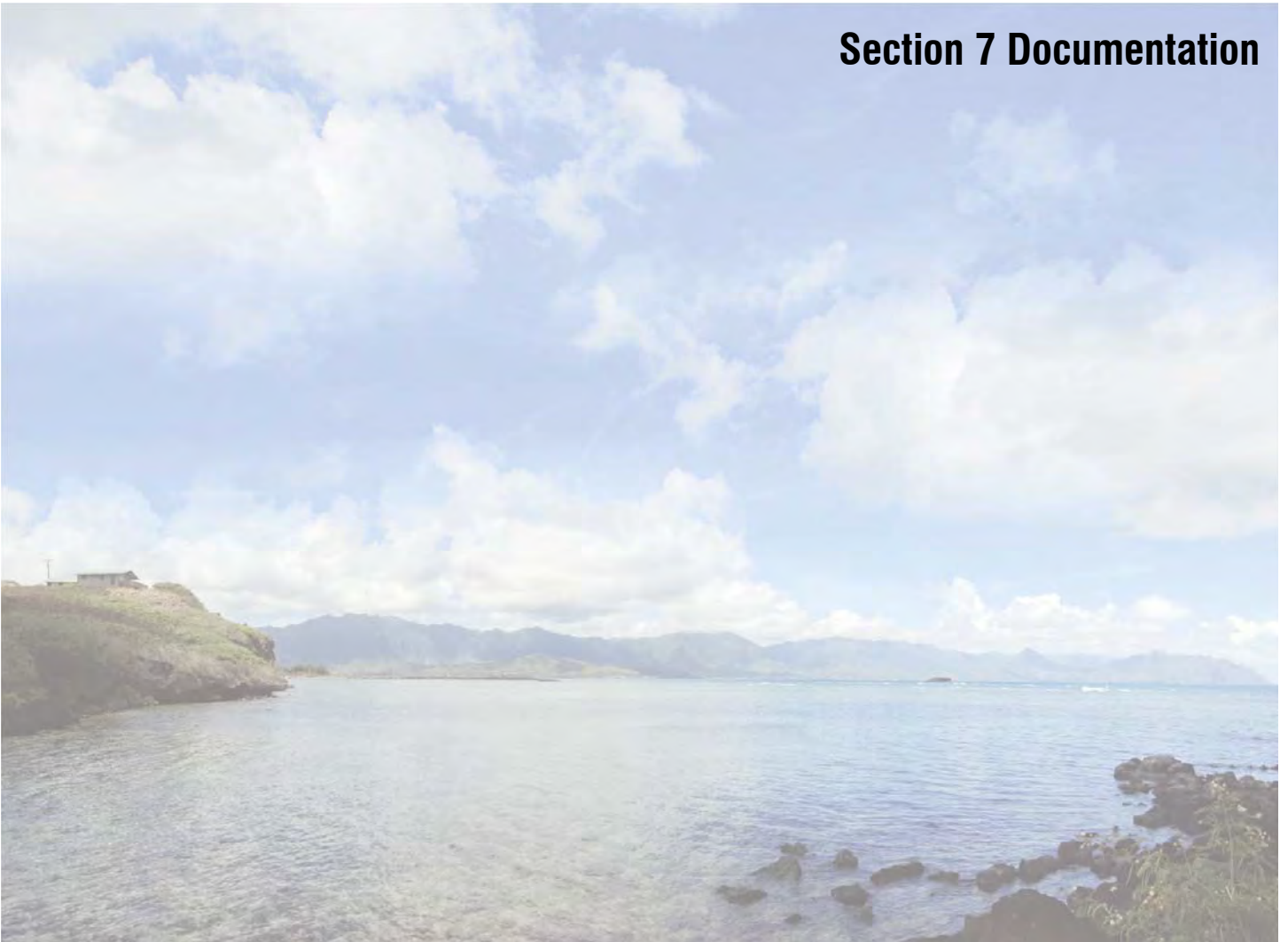
Sincerely,



KAREN C. SUMIDA
Business Line Manager
Environmental

Appendix C
ESA Section 7 and EFH Consultation

Section 7 Documentation





DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, PACIFIC
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HAWAII 96860-3134

5090P.1F13B
Ser EV2/0040
25 January 2016

Mary Abrams
Fish and Wildlife Administrator
U.S. Fish and Wildlife Service
Pacific Islands Office
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, HI 96850

Dear Ms. Abrams:

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR THE PROPOSED EXPANSION AND OPERATION OF THE PALI KILO BEACH COTTAGES AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII

Pursuant to the Sikes Act Improvement Amendment (SAIA) and section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 USC § 1531 et seq.), the Navy requests informal consultation with the United States Fish and Wildlife Service (USFWS) and concurrence in our finding of *may affect, but is not likely to adversely affect* (NLAA) ESA protected species in the course of the proposed expansion and operation of the Pali Kilo Cottages at Marine Corps Base Hawaii (MCB Hawaii), Kaneohe Bay.

A full description and analysis of the proposed action, the action area, and impacts and findings for ESA species and EFH is provided in enclosure (1): Biological Evaluation for the Proposed Expansion of the Pali Kilo Cottages, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii

Summary of the Proposed Action:

Naval Facilities Engineering Command Pacific (NAVFACPAC) is preparing an Environmental Assessment (EA) for Marine Corps Community Services (MCCS), which proposes to increase the number of recreational cottages at MCB Hawaii, Kaneohe Bay, in order to accommodate additional guests, meet the existing and future needs of guests, and promote the overall morale and welfare of the U.S. Marine Corps and larger U.S. Department of Defense (DOD) community.

The proposed action consists of constructing up to 49 new recreational cottages along the Pali Kilo area of the Mokapu Peninsula at MCB Hawaii, Kaneohe Bay (supplementing the existing 14 lodging units). More specifically, 19 separate single or duplex cottages (35 cottage units) would be constructed, along with a 14 unit Efficiency Unit complex.

MCB Hawaii Kaneohe Bay. This is located on the western edge of Mokapu Peninsula in the He'eia ahupua'a land division within the Ko'olaupoko District of Oahu. This coastal area is bordered by Palikilo Road to the east, and the shoreline of Kaneohe Bay to the west that extends northward to the geological feature known as Kuau or Pyramid Rock.

The impact area for the action alternatives includes the area from the shoreline inland to Palikilo Road and Mokapu Road, and from Building 1304 (near south beach cove) north up to Building 1607 (Presidential Cottage). This project area encompasses about 16.8 terrestrial acres. This area can be described as being somewhat rural in character with a predominantly rocky coastline. The shoreline also has a few small pocket beaches, as well as a small cove to the south (south beach cove) on the southern extent.

Also included in the action area are the nearshore marine resources along the Pali Kilo shoreline seaward of where proposed construction would occur. It is expected that BMPs will entirely mitigate direct impacts from upland construction. However, it is possible that additional lodging may increase recreational use of the nearshore marine environment. Therefore, a portion of marine habitat adjacent to the impact footprint has been included in the action area.

Listed Species within the Action Area:

We have determined that species in the action area listed pursuant to ESA, under USFWS jurisdiction, are the threatened green sea turtle (*Chelonia mydas*), and endangered hawksbill sea turtle (*Eretmochelys imbricata*). Please let us know if there are other listed or proposed species in the project area that may be affected that we have not considered.

Summary of impacts and findings for ESA species:

Direct effects related to the construction of the new cottage and efficiency units include impacts from human presence, disturbance from construction noise, and exposure to sedimentation, wastes, and discharges. Some construction activities may be far enough away from the shoreline and/or have topographic features that block direct effects from construction related activities. Additionally, construction-related impacts will be mitigated through extensive best management practices. Indirect effects that could occur post-construction include disturbance from human recreation activities on the Pali Kilo shoreline and in the marine environment as a result of increased recreational activities from cottage users. These effects can be mitigated through extensive outreach and education of cottage users and enforcement of regulations governing use of the beach cottages.

The Navy requests your concurrence with our determination that the proposed action *may affect but is not likely to adversely affect the ESA species listed above, because the effects, if any, will be insignificant*. The project impacts will be insignificant in scope and duration and no taking of any listed species is expected. Additionally, there is no critical habitat designated within the action area. As such, a formal consultation will not be required.

Conservation Measures:

The BMPs and Conservation Measures found in Section 6 and 7 of the Biological Evaluation, included with this letter as Enclosure 1, ensure protection of hawksbill and green sea turtles during the construction of the proposed action.

Outreach and signage materials will ensure that guests have the knowledge to act and report responsibly in the event that protected species haulout on the Pali Kilo shoreline. Additionally, MCB Hawaii conservation measures for managing haulouts will minimize and protect ESA listed species on the Pali Kilo shoreline if they haulout there.

In closing, considering the biology of hawksbill and green sea turtles and the proposed actions, NAVFACPAC has determined that the proposed project *may affect, but is not likely to adversely affect* the green and hawksbill sea turtle. NAVFACPAC looks forward to consulting with you on this matter and requests USFWS concurrence with this NLAA determination. Should you have any questions please contact Ian Lundgren, Natural Resources Management Specialist for coral reefs on my staff, by phone at (808) 472-1426 or by email at ian.f.lundgren@navy.mil.

Sincerely,



KAREN SUMIDA
Business Line Manager
Environmental

- Enclosure: 1. Biological Evaluation and Essential Fish Habitat Assessment, The Cottages at Kaneohe Bay Expansion Project, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii
- Enclosure: 2. Baseline Assessment of Marine Resources Near The Cottages at Kaneohe Bay, Marine Corps Base Hawaii April 2015



United States Department of the Interior



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

In Reply Refer To:
01EPIF00-2016-I-0180

MAR 18 2016

Karen Sumida
Business Line Manager
Environmental
Department of the Navy
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Ste 100
Pearl Harbor, Hawai'i 96860-3134

Subject: Informal Consultation for the Proposed Expansion and Operation of the Pali Kilo Beach Cottages at Marine Corps Base Hawai'i, Kāne'ohe Bay, O'ahu, Hawai'i

Dear Ms. Sumida:

The U.S. Fish and Wildlife Service (Service) received your letter on February 2, 2016, requesting our concurrence with your determination that the Proposed Expansion and Operation of the Pali Kilo Beach Cottages at Marine Corps Base Hawai'i, located in Kāne'ohe Bay, on the island of O'ahu, Hawai'i, may affect, but is not likely to adversely affect the federally threatened green sea turtle or honu (*Chelonia mydas*) and endangered hawksbill sea turtle (*Eretmochelys imbricata*), collectively referred to as sea turtles. The findings and recommendations in this consultation are based on (1) your letter dated January 25, 2016; (2) your April 2015 Baseline Assessment of Marine Resources near Pali Kilo Cottages; (3) your January 2016 Biological Evaluation for the Pali Kilo Cottages; (4) phone conversations between your office and the Service; and (5) other information available to us. A complete administrative record is on file in our office. This response is in accordance with the Sikes Act Improvement Amendment (SAIA), the Threatened and Endangered Species Recovery Act of 2005, and section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

Project Description

The Naval Facilities Engineering Command Pacific (NAVFACPAC) is preparing an Environmental Assessment (EA) for Marine Corps Community Services (MCCS), which proposes to increase the number of recreational cottages at MCB Hawai'i, Kāne'ohe Bay, in order to accommodate additional guests, meet the existing and future needs of guests, and promote the overall morale and welfare of the U.S. Marine Corps and larger U.S. Department of Defense (DOD) community.

The proposed action consists of constructing up to 49 new recreational cottages along the Pali Kilo area of the Mōkapu Peninsula at MCB Hawai'i, supplementing the existing 14 lodging units. More specifically, 19 separate single or duplex cottages (35 cottage units) would be constructed, along with a 14 unit Efficiency Unit (EU) complex.

The EU will be located at the site of Building 1180 (currently storage for portable equipment). Building 1180 would subsequently be demolished, and its equipment relocated to a new building constructed at a location in the southern area of the base based upon coordination within MCB Hawai'i. A 10,000 square foot, open lawn area along D Street across from Building 242 has been selected as this relocation site.

The construction area for the proposed action generally includes the area from the shoreline inland to Pali Kilo Road and Mōkapu Road, and from Building 1304 (near south beach cove) north up to Building 1607 (Presidential Cottage). This construction area encompasses about 16.8 terrestrial acres. The shoreline also has a few small pocket beaches, as well as a small cove to the south (south beach cove) at the southern extent.

Service Comments

We understand your Navy NEPA coordinator obtained a "no effect" determination for federally protected bird species from Navy SME, Justin Fujimoto. This will be included in the Environmental Assessment, which is in draft form and under review by the action proponent.

Under section 7 of the ESA, it is the Federal agency's responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

The Service consults on sea turtles and their use of terrestrial habitats (beaches where nesting and/or basking is known to occur); whereas the National Marine Fisheries Service (NMFS) consults on sea turtles and their use of off-shore and open ocean habitats. Therefore, we reviewed the proposed project for potential impacts to turtles in their terrestrial habitats only; and we understand that you have completed consultation with NMFS regarding the potential impacts from the proposed project to sea turtles and their use off-shore and open ocean habitats.

Conservation Measures

The following measures identified in your letter and enclosures will be implemented at the project site to avoid and minimize effects to sea turtles. These conservation measures are considered part of the project description. Any changes to, modifications of, or failure to implement these conservation measures may result in the need to reinitiate this consultation.

- The project manager shall designate at least one lookout to monitor the shoreline and beaches adjacent to the proposed action for sea turtles.
- During construction, surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour, and periodically throughout the day.
- The presence of any sea turtles on the shoreline will be reported to MCBH Natural Resource managers.
- All work shall be postponed or halted if ESA-listed marine species are within 50 yards of the proposed work, if the marine species appears disturbed by construction activity regardless of distance, and shall only begin/resume after the animals have voluntarily departed the area.
- All personnel will stay more than 100 feet (45.5 meters) from sea turtles that haul out on the beach.
- Personnel will not perform work on or near the beach if turtle nesting is known or suspected to be occurring.
- A contingency plan to control hazardous materials shall be required.
- Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available. In the event of a hazardous material spill, the Environmental Department will be immediately notified and standard remediation measures implemented.
- The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
- Fueling of land-based vehicles and equipment shall take place at least 100 feet away from the water, preferably over an impervious surface.
- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
- A plan shall be developed and implemented to prevent debris and other wastes from entering or remaining in the marine environment during the project.
- At registration, administer required viewing of an educational video on the unique and fragile natural resources and responsible recreation practices for all occupants and guests, including those not residing overnight. (A suitable video has been produced and will be provided by MCBH, free reprinting service is available via MCBH Combat Camera). Additionally, informational pamphlets will be provided with the keys.
- Facilities design must include drainage features that retain water runoff on site, and approved by MCBH.
- Facilities design must include lighting that is designed to avoid light pollution at the shoreline, and approved by MCBH.
- Non-native vegetation will not be planted in association with the landscaping of these properties. Landscaping will be consistent with the Base Landscape Manual; copies are available through the Environmental Department Vegetation clearing between cottages and the shoreline must be approved by the Environmental Department.

- Post and maintain signs on cottage lanais or common areas of the EUs that provide information on the following requirements (content and cost estimate will be provided by MCBH Environmental Department):
 - appropriate (legal) behavior with respect in the presence of sea turtles and required notification procedures in the case of sea turtle haul outs;
 - authorized beach access areas and prohibition from creating and/or utilizing social trails to the shoreline;
 - appropriate (legal) behavior with respect to touching, standing, or walking on live rock or coral reef habitat;
 - appropriate (legal) fishing and resource extraction activities, however Rod and reel fishing from shore will be prohibited;
 - responsible waste and litter management;
 - and invasive species management and proper cleaning of in-water gear to limit new introductions.
- MCBH Environmental Department will post and maintain signs addressing the criteria in at beach access points.
- MCCS will post and maintain signs and information pamphlets addressing the criteria on cottage lanais and in EUs.
- Develop and enact monitoring of guest behavior to evaluate compliance with responsible recreation guidance. Enforce non-compliance with guidance up to and including loss of access privilege and eviction of facilities.
- Provide in kind support to the Hawai'i Institute of Marine Biology (HIMB) in exchange for biannual coral reef community resource health surveys to track trends of the marine environment (methods approved by MCBH) in the action area relative to reference areas. If anomalous negative trends are detected, restrict guest recreational behavior accordingly based on guidance from MCBH. In kind support could include providing use of boat and SCUBA tank fills. Final compensation to be determined through an agreement with HIMB or another entity with appropriate expertise.

Sea turtles

Sea turtles are susceptible to artificial lighting that can disorient turtles away from the ocean. Sea turtles come ashore to nest on beaches from May through September, peaking in June and July. Optimal nesting habitat is a dark beach free of barriers that restrict their movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. If they do come ashore, they may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line where nests are unlikely to be successful). Hatchlings that emerge from unprotected nests may be disoriented by artificial lighting, move inland instead of toward the ocean and not make it successfully to the ocean. By implementing the above conservation measures, the proposed project will avoid potential adverse effects to sea turtles.

Summary

We concur that the proposed project may affect, but is not likely to adversely affect, sea turtles. Unless the project description changes, or new information reveals that the proposed project may affect listed species in a manner or to an extent not considered, or a new species or critical

habitat is designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary.

If you have any questions or concerns regarding this consultation, please contact Jiny Kim, Fish and Wildlife Biologist (phone: 808-792-9400, email: jiny_kim@fws.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "V. Kim" with a large flourish extending to the right. Below the signature, the word "(for)" is written in a smaller, cursive script.

Aaron Nadig
Island Team Manager
O'ahu, Kaua'i, Northwestern Hawaiian
Islands, and American Samoa



DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING COMMAND, PACIFIC
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HAWAII 96860-3134

5090P.1F13B
Ser EV2/0039
25 January 2016

Mr. Michael Tosatto
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-4700

Dear Mr. Tosatto:

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR THE PROPOSED EXPANSION AND OPERATION OF THE PALI KILO BEACH COTTAGES AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII

Pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 USC § 1531 et seq.), the Navy requests informal consultation with the National Marine Fisheries Service (NMFS) regarding the proposed expansion and operation of the Pali Kilo Cottages at Marine Corps Base Hawaii (MCB Hawaii), Kaneohe Bay. The action area includes the construction footprint (impact area) and the nearshore marine environment along the Pali Kilo coastline.

We have determined that species in the action area that are listed pursuant to the Endangered Species Act (ESA) are the threatened green sea turtle (*Chelonia mydas*), endangered Hawaiian monk seal (*Monachus schauinslandi*), and the endangered hawksbill sea turtle (*Eretmochelys imbricata*). Please let us know if there are other listed or proposed species in the project area that may be affected that we have not considered.

This letter also requests consultation to fulfill Navy's requirements to consider the impacts of its actions on Essential Fish Habitat (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1801 et seq.).

A full description and analysis of the proposed action, the action area, and impacts and findings for ESA species and EFH is provided in enclosure (1): Biological Evaluation for the Proposed Expansion of The Pali Kilo Cottages, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii

Summary of the Proposed Action:

Naval Facilities Engineering Command Pacific (NAVFACPAC) is preparing an Environmental Assessment (EA) for Marine Corps Community Services (MCCS), which proposes to increase the number of recreational beach cottages at MCB Hawaii, Kaneohe Bay, in order to accommodate additional guests, meet the existing and future needs of guests, and

The proposed action consists of constructing up to 49 new recreational cottages along the Pali Kilo area of the Mokapu Peninsula at MCB Hawaii, Kaneohe Bay (supplementing the existing 14 lodging units). More specifically, 19 separate single or duplex cottages (35 cottage units) would be constructed, along with a 14 unit Efficiency Unit complex.

Description of the Action Area:

The recreational cottages are situated along a coastal reach referred to as Pali Kilo within MCB Hawaii Kaneohe Bay. This is located on the western edge of Mokapu Peninsula in the Heeia ahupuaa within the Koolau Poko District of Oahu. This coastal area is bordered by Palikilo Road to the east, and the shoreline of Kaneohe Bay to the west that extends northward to the geological feature known as Kuau or Pyramid Rock.

The impact area for the action alternatives includes the area from the shoreline inland to Palikilo Road and Mokapu Road, and from Building 1304 (near south beach cove) north up to Building 1607 (Presidential Cottage). This project area encompasses about 16.8 terrestrial acres. This area can be described as being somewhat rural in character with a predominantly rocky coastline. The shoreline also has a few small pocket beaches, as well as a small cove to the south (south beach cove) on the southern extent.

Also included in the action area are the nearshore marine resources along the Pali Kilo shoreline seaward of where proposed construction would occur, because it is possible that additional lodging may increase recreational use of the nearshore marine environment. Therefore, a portion of marine habitat adjacent to the impact footprint has been included in the action area. It is expected that BMPs and Conservation Measures found in Sections 6 and 7 of the Biological Evaluation will entirely mitigate direct and indirect impacts, and sufficiently reduce adverse effects to Essential Fish Habitat from recreational activities.

Summary of impacts and findings for ESA species:

Direct impacts related to the construction of the new cottage and efficiency units include impacts from human presence, disturbance from construction noise, and exposure to sedimentation, wastes, and discharges. Some construction activities may be far enough away from the shoreline and/or have topographic features that block direct effects from construction related activities. Additionally, construction-related impacts will be mitigated through extensive best management practices. Indirect effects that could occur post-construction include disturbance from increased human recreational activities on the Pali Kilo shoreline and in the marine environment as a result of recreation activities from cottage users. These effects can be mitigated through extensive outreach and education of cottage users.

The Navy requests your concurrence with our determination that the proposed action *may affect but is not likely to adversely affect the ESA species listed above, because the effects, if any, will be discountable*. The project impacts will be insignificant in scope and duration and no taking of any listed species is expected. Additionally, there is no critical habitat designated within the action area. As such, a formal consultation will not be required.

Summary of impacts and findings EFH:

The impact area of the proposed project is terrestrial; however future impacts to essential fish habitat are possible as a result of increased recreation activity in the nearshore marine environment as a result of this action. However, the Navy has determined that *the proposed project may affect EFH, but effects will be minimal and insignificant, because steps can be taken to minimize and avoid adverse effects on EFH.* Negative effects to EFH can be mitigated through cooperative education and outreach programs implemented by MCCA and MCB Hawaii.

Thank you for your consideration of our request for your review and concurrence. Should you have any questions or other concerns, please contact Ian Lundgren, Natural Resources Management Specialist for coral reefs on my staff at (808) 472-1426 or ian.f.lundgren@navy.mil.

Sincerely,



KAREN SUMIDA
Business Line Manager
Environmental

- Enclosure: 1. Biological Evaluation and Essential Fish Habitat Assessment, The Cottages at Kaneohe Bay Expansion Project, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii
- Enclosure: 2. Baseline Assessment of Marine Resources Near The Cottages at Kaneohe Bay, Marine Corps Base Hawaii April 2015



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg. 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

JUN 09 2016

Ms. Karen Sumida
Department of the Navy
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134

Dear Ms. Sumida:

This letter responds to your February 26, 2016 letter, subsequent electronic mail messages, and other correspondence regarding your proposed action to add more cottages to expand the existing Pali Kilo complex of recreational cottages on Marine Corps Base Hawaii (MCBH) in Kaneohe Bay, Oahu, Hawaii. In the letter, the Navy, on behalf of the MCBH determined that the proposed Expansion and Operation of the Pali Kilo Cottages project is not likely to adversely affect (NLAA) endangered or threatened species under our jurisdiction, and requested our concurrence under section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq.*), with that determination.

Proposed Action

In summary, the MCBH proposes to increase the number of units from 14 lodging units to a total of 48 units. The MCBH is building 12 single or duplex cottages which would serve up to 24 units, and an efficiency unit complex, or a hotel or dormitory-like structure that would serve another 10 units. The construction area encompasses 16.8 acres of lightly-developed rocky coastline. The MCBH will use various heavy equipment, machinery, and vehicles to construct the houses. All construction will be upland and far from marine water.

The Efficiency Unit (EU) will replace an existing storage building. The proposed cottages will be placed between building 1305 on the south beach cove and the Presidential cottage, between Palikilo Road and the shore.

None of the units are being placed closer to shore than the existing units. All proposed single or duplex units will be placed outside of the VE flood zone (or areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action). A portion of the EU will be placed in the VE flood zone but the structure replaces an existing building and associated parking lot, which is presently located closer to shore. The rebuilt structure will be higher and further from shore, and associated parking will be located further away from shore. The MCBH will convert approximately 0.84 acres (36,384 square feet) of scrub vegetation to impervious or partially impervious man-made surface. Each of the twelve stand-alone cottage (duplex or single) will be up to 2,600 square feet (SF) in area. We estimate an additional 32 SF (8 feet on each side) around each cottage will be removed and re-landscaped. We also estimated that the MCBH will add an additional 4,800 SF of impervious surface for a new road and parking area which will serve many of the new cottages. Since the EU is replacing an area that is almost completely impervious, we do not expect an increase in impervious



surfaces from the build-out of the EU. The majority of the vegetation being removed is non-native scrub vegetation with non-native grasses, and few or no trees larger than 6-inches diameter at breast height. The MCBH will landscape disturbed areas around cottages and the EU with at least 50% of the native trees, shrubs, and groundcover.

Existing cottages host a maximum 6 people per unit. According to the Navy, the annual average occupancy for the existing units is 90% with an average of 2.8 guests per unit. This extrapolates to an average of 39 people per day, with a maximum of 84. Assuming similar user rates, the Navy estimated the expansion would potentially add 94 additional people per day to the area, with a maximum of 131. The MCBH will install interpretive signs on beaches and cottage porches, and brochures in each cottage or studio, which will promote their natural resources program and educate users to care for the fragile aquatic resources on the base. This is intended to reduce the impact of additional human use in the action area as a result of increasing lodging at Pali Kilo. We have little data other than observations by several biologists and natural resource specialists from NMFS, USFWS, the Navy, and MCBH. Absent that data, the MCBH is also proposing to gather baseline information on the health of the reef in the action area, and will monitor the action area for changes. We expect some changes in the reef condition over time due to increased human use. If the MCBH determines human-caused damage to the reef and aquatic habitat in the action area is occurring at a high rate or a larger area than anticipated, they will increase or restructure their management in the area to reduce or reverse the trend.

The MCBH will implement erosion control measures to prevent siltation, and pollutants from all upland construction from running off into marine waters. The MCBH will direct stormwater from all impervious surfaces to retain water on site to prevent an increase of long-term runoff from flowing into marine waters. The MCBH will also implement low impact development to further reduce their impact to the surrounding area, and will install lights to direct away from the shore to prevent light pollution and reduce effects to marine life.

Action Area

The action area for this project includes areas affected by increased human use associated with the addition of units. This action area includes all land being cleared and/or developed by construction of the cottages, stormwater retention and infiltration areas, all three beaches within the action area, and the reef area directly in front of the existing and proposed new buildings, and is outlined in figure (1). The action area is approximately 25 acres including land and water area.



Figure (1) – Action area at Pali Kilo Beach, Kaneohe, Oahu. Land action area is outlined.

Listed Species

The Navy determined that the ESA-listed threatened and endangered species under NMFS jurisdiction listed in Table 1 are known to occur, or could reasonably be expected to occur, in Kaneohe Bay, Oahu, and may be present in the action area.

The action area does not contain designated critical habitat for Hawaiian monk seals because it is within MCBH, which is managed by their Integrated Natural Resource Management Plan and excluded under Section 4(a)(3)(B)(i) of the ESA (80 FR 50925).

Table (1) - ESA listed species considered in this consultation.

ESA Species	Listing Status	Listing Date and Federal Register Notice	Critical Habitat Date and Federal Register Notice (if applicable)
Central North Pacific Green sea turtle (<i>Chelonia mydas</i>)	Threatened	05/06/2016 81 FR 20057	N/A
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	Endangered	06/02/1970 35 FR 8491	09/02/1998 63 FR 46693
Hawaiian monk seal (<i>Neomonachus schauinslandi</i>)	Endangered	11/23/1976 41 FR 51611	08/21/2015 80 FR 50925 Not in action area

Detailed information about the biology, habitat, and conservation status of sea turtles and monk seals can be found in their status reviews, recovery plans, federal register notices, and other sources at <http://www.nmfs.noaa.gov/pr/species/esa/>.

Analysis of Effects

In order to determine that a proposed action is NLAA listed species, NMFS must find that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook: (1) insignificant effects relate to the size of the impact and should never reach the scale where take occurs; (2) discountable effects are those that are extremely unlikely to occur; and (3) beneficial effects are positive effects without any adverse effects (USFWS & NMFS 1998). This standard, as well as consideration of the probable duration, frequency, and severity of potential interactions, was applied during the analysis of effects of the proposed action on ESA-listed marine species, as is described in detail in the Navy's consultation request.

The MCBH may expose listed species to increased human use and other indirect effects associated with increasing the number of patrons renting facilities at the Pali Kilo cottages. These exposures include human disturbance from snorkeling, kayaking, surfing, fishing, spearfishing, swimming, and wading. Neritic sea turtles and Hawaiian monk seals are large and agile, and capable of swimming away safely from any disturbance that would harm them. The MCBH has a natural resources program, an Integrated Natural Resources Management Plan, and have posted rules on interacting with listed marine life on signs throughout the base. To reduce adverse human interaction, the MCBH and the MCCS will post signs and distribute material to patrons using the cottages and people using the beaches, which will direct them to give listed species space, and not to touch, pursue, or feed them. We expect increased human disturbance

from increased swimming, snorkeling, and other human presence would not injure sea turtles or monk seals or prevent them from foraging or resting, and will have insignificant effects on listed species in the action area.

Increased human use in the marine waters in front of the new and existing units will likely degrade the health of the reef and aquatic habitat, which could indirectly affect sea turtles and monk seals by damaging or reducing the quality of their forage area. Coral reefs are an integral part of the neritic ecosystem throughout the main Hawaiian Islands, providing habitat for hundreds of vertebrate and invertebrate species, including sea turtles, monk seals, and their forage. The health of a coral reef often correlates to species diversity, biomass, and production. Pali Kilo Beach consists of three beaches which are surrounded by steep cliffs and hills which do not provide easy access to the sea. Since the EU is situated closest to the northern beach, we expect the majority of the increased use associated with these additional structures to concentrate there. Most of the proposed new cottages also funnel toward the northern beach as well. Directly in front of the northern beach has a sandy patch, which is deeper than most of the other areas, and has the least amount of corals in the entire area, which makes it relatively better for swimming than the other entries.

The southern beach is the largest beach and a large parking area nearby invites lots of non-cottage users to access the beach there. Only two additional cottages are being added in that general location. While the southern beach is presently the most accessed beach, and people are presently swimming and wading at low intensities. The southern beach generally provides poor swimming opportunities because of its shallow depth, rocks, and corals, and it would be difficult to crowd more people into un-swimmable areas of this beach. Most non-village users are generally paddling out to popular surf sites, or fishing areas outside of the action area. The middle beach is the smallest of the beaches, is only accessed by one cottage, and is not heavily used. Swimming, wading, paddleboarding, snorkeling, and spearfishing were observed in the action area at generally low levels (personal observation). These activities could result in coral trampling, breakage, and other disturbances that could kill or degrade coral. We expect the changes to concentrate in the northern beach, where the least amount and lowest quality of coral and forage habitat exists. We do not expect these changes to be widespread throughout the action area, and we expect observations of green sea turtles to occur at similar levels after construction and operation of the new facilities, indicating continued use of the action area.

Hawksbill sea turtle and Hawaiian monk seal sightings will likely continue to be rare in the action area unless their local populations increase. Human use and damage or degradation to coral reefs will increase but will have an insignificant effect on listed species because the quantity and quality of sea turtles and monk seals foraging areas are not limiting in the action area and marine areas throughout the base, and effects on foraging opportunities and locations will be immeasurable.

Some shore fishing exists at generally low levels from all beaches. The addition of cottages and patrons renting them could also increase the hook and line fishing at the site, which could lead to increased hookings or entanglements of listed species. However, all beaches are small, especially the northern beach (approximately 120 feet in length), and have limited space for more fishing poles or effort than what already exists where most of the increases are expected to

occur. There could be an increase at the southern beach, but the shallow nature of the beach there make it less attractive for shorecasting, and patrons would compete with non-cottage users who presently use the beach as well. We do not anticipate a significant increase of hook and line fishing from the added number of patrons, and an increase of their effects because the lack of space is likely to prevent increases in effort. Long-term effects associated with increased fishing will therefore have discountable effects on listed species in the action area.

We expect all construction-related effects to have either insignificant or discountable effects on listed species. Short-term construction-related effects will be insignificant because all proposed construction is upland and far from shore (closest construction is 60 feet horizontal and more than 10 feet vertical from mean higher high water), and noises from construction will be immeasurable in water, where waves and moderate wind conditions are common. Conservation measures incorporated in the project by the MCBH will prevent suspended sediments and pollutants from running off into the marine water where listed species can be exposed, or levels would be so low that it would be immeasurable to listed species. Likewise, long-term effects from an increase of 0.84 acres of impervious surface will have discountable effects because all stormwater is being directed toward vegetated rocky and sandy land where it will infiltrate and not enter marine water directly.

Based on consideration of the record as presented in the information and assessments in the Navy's consultation request and follow-up materials, and the best scientific information available about the biology and expected behaviors of the ESA-listed marine species considered in this consultation, NMFS concurs with 1) the list of ESA-listed species and critical habitat potentially exposed to the effects of the action, 2) the suite of identified stressors, and 3) the Navy's assessment of exposure risk and significance of exposure to those stressors.

Conclusion

NMFS concurs with your determination that conducting the proposed Expansion and Operation of the Pali Kilo Beach Cottages project is NLAA Central North Pacific green sea turtle, hawksbill sea turtle, and Hawaiian monk seal. This concludes your consultation responsibilities for this action under the ESA for species under NMFS' jurisdiction. If necessary, consultation pursuant to Essential Fish Habitat would be completed by NMFS' Habitat Conservation Division in separate communication.

ESA Consultation must be reinitiated if: 1) take occurs; 2) new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the identified action is subsequently modified in a manner causing effects to listed species or designated critical habitat not previously considered; or 4) a new species is listed or critical habitat designated that may be affected by the identified action.

If you have further questions please contact Joel Moribe on my staff at (808) 725-5142 or joel.moribe@noaa.gov. Thank you for working with NMFS to protect our nation's living marine resources.

Sincerely,



Ann M. Garrett
Assistant Regional Administrator

NMFS File No. (PCTS): PIR-2016-9803
PIRO Reference No.: I-PI-16-1367-AG

Literature Cited

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook. Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf

Appendix D

NHPA Section 106 Consultation





UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/154-15

OCT 22 2015

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

RE: NATIONAL HISTORIC PRESERVATION ACT (NHPA) SECTION 106 CONSULTATION:
CONSTRUCT BEACH COTTAGES ABOARD MARINE CORPS BASE HAWAII, AHUPUA'A OF
HEEIA, DISTRICT OF KO'OLAUPOKO, ON THE ISLAND OF O'AHU, TMK 1-4-4-
008:001.

Dear Dr. Downer:

Marine Corps Base (MCB) Hawaii is consulting with your office in compliance with Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed undertaking that will construct beach cottages aboard MCB Hawaii. This letter initiates our Section 106 consultation for this project.

PROJECT DESCRIPTION

The proposed undertaking (or project) is located along the west coast of Mokapu Peninsula in the area known as Pali Kilo. This area is west of Pali Kilo and Mokapu Roads [enclosure 1], and is an area where existing beach cottages "dot" the coastal landscape. The project proposes to construct beach cottages and a lodge complex. Although the project originally proposed to building 19 beach cottages and a "U" shaped lodge complex, the number was reduced to 12 beach cottages and an "L" shaped lodge complex to avoid archaeological sites discovered during an archaeological survey (Gosser et al. 2015). The beach cottages will vary in size depending on the location of individual cottages. One of the beach cottages will be a single unit (approximately 950 to 1,050 square feet) [enclosure 2], and 11 are proposed to be duplex units (approximately 2,600 square feet each) [enclosure 3]. The lodge complex would be reduced from 14 efficiency units down to 10, with each unit measuring approximately 450 to 500 square feet. Enclosure 4 shows a proposed conceptual site plan of the lodge complex. Facility 1180 is currently on the footprint of the proposed lodge complex. This building would be demolished and a new building constructed in an area across from Facility 242 along D Street [enclosure 5].

The proposed project to construct new beach cottages is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA).

IDENTIFICATION OF HISTORIC PROPERTY

As mentioned above, the proposed project consists of constructing additional cottages in Pali Kilo. The proposed cottages are being sited to avoid historic buildings and archaeological sites located within Pali Kilo.

Architectural Resources. During World War II, the Army constructed Seacoast Fortifications and numerous coastal gun emplacements including several batteries in the Pali Kilo area, such as the Anti-Motor Torpedo Boat Battery No. 7 near Pyramid Rock. They also constructed a Seacoast Search Light (Positions 31 and 32) approximately 50 feet above the shoreline. Although the foundations of

these features remain, they are located north of the proposed project area. Several small arms magazines and inert storehouses were also constructed in Pali Kilo [enclosure 6]. Of the group of seven small arms magazines that were all constructed in 1941, one (Facility 704) is located within the proposed area of potential effect (see below for APE determination). This magazine consists of a concrete barrel vaults design measuring 5 by 12 meters (16 by 40 feet) that has been covered with an earthen berm [enclosure 7]. A wide driveway with concrete walls on three sides extends to the entrance of the vault (Facility 704). Two inert storehouses, both constructed in 1941, are also located within the APE (Facilities 715 and 1231) [enclosure 7]. Facility 715 consists of an underground bunker with a walkway entrance. Facility 1231 has a concrete stair leading down to a metal door that opens into an underground bunker. The small arms magazines and inert storehouses are covered under the Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities and the Navy/Marine Corps have met their Section 106 requirements and obligations for undertakings affecting World War II and Cold War Era ammunition storage facilities. The small arms magazines and inert storehouses will be left in place and not modified during this project. No additional historic buildings are present within the project area (Environmental 2011; Mason Architects 2014).

Archaeological Resources. Enclosure 8 depicts the locations of extensive archaeological research that has been conducted in the Pali Kilo area (Barrera 1981; Clark 1980; Clark et al. 2004; Drolet et al. 1996; Gosser et al. 2015; Morrison et al. 2010; O'Day 2007; Tuggle 1986; Williams and Schilz 1996). Eight archaeological sites are located within the proposed APE [enclosure 1]. They consist of four traditional Hawaiian sites (Site 2883, 5733, 7722, and 7724), and four historic era sites (Sites 4610, 4611, 7725, and 7726). Sites 2883, 5733, 7722, and 7724 consist of buried archaeological deposits containing features, artifacts, midden, and charcoal. These four sites once may have been contiguous (O'Day and Welch 2007:26). Radiocarbon dating obtained from charcoal samples from Sites 2883 and 5733 suggests initial occupation between A.D. 1690 and 1730, with continuing use through the 1930s and until the present (Anderson 1998:57). Radiocarbon dating of *Chenopodium oahuenses* charcoal from Sites 7722 and 7724 obtained a calibrated age of A.D. 1675 to 1942 (Gosser et al. 2015:119), which suggests that these sites are contemporaneous with Sites 2883 and 5733.

Sites 4610 [enclosure 9], 4611, 7725, and 7726 are four of the 1930s era house foundations and associated garden walls located along the Pali Kilo coast. These lots formed part of the Mokapu Tract Subdivision, which was created in partnership with Samuel Wilder King (a member of the Sumner family), Bishop Trust Company, Ltd, and A.H. Rice & Co., Ltd in 1931 (Tomonari-Tuggle 2014). The coastal area was subdivided into 138 lots, most of which ranged in size from 12,150 to 49,300 square feet [enclosures 10 to 12].

The Mokapu Burial Area (Site 1017, MBA), is located 120 m east of the proposed beach cottage construction project (i.e. undertaking) and extends along the northern shoreline of Mokapu Peninsula between Pyramid Rock and Ulupau Crater [enclosure 1 for depiction of western end of MBA]. This site was listed in the National Register of Historic Places (NRHP) in 1972. The Mokapu Burial Area consists largely of vegetated sand dunes located above the active beach in which burials and cultural deposits have been recorded (Tomonari-Tuggle 2014).

In addition to the above, part of the proposed project includes demolition of Facility 1180, an [REDACTED] operations building constructed in 1959 [enclosure 4]. This building has been determined not eligible for listing in the NRHP since it is not distinctive and does not have any Cold War significance (Mason

Architects 2014:B-20). The area proposed for relocation of Building 1180 is located across from Facility 242 [enclosure 5]. No archaeological sites or deposits have been identified in this area during previous archaeological work [enclosure 13]. This area is located across D Street from Facility 242 (Facilities Building), which has been determined not eligible for listing on the NRHP due to loss of integrity. This proposed location is behind Facility 201, a former Utilities Shop and Parachute Loft-Stowage building constructed in 1941 that has been determined eligible for listing in the NRHP (Environmental 2011) [enclosures 14 to 16]. The principle view of this structure is from its front (southern side) along First Street, while the rear of the building faces a parking lot. Construction on this rear (north) side would be preferable and distract less from the building's overall historic setting.

AREA OF POTENTIAL EFFECT

The area of potential effect (APE) has been determined to include the western portion of Pali Kilo from Perimeter Road north along the Kaneohe shoreline on the west and Pali Kilo Road and Mokapu Road on the east to an area below the Presidential Cottage aboard MCB Hawaii. The APE also includes the 10,000 square foot area on D Street across (west) from Facility 242 and behind (north) Facility 201.

DETERMINATION OF AFFECT

MCB Hawaii has determined that the proposed project to construct beach cottages will result in no adverse effect to historic properties in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) the proposed cottages are being sited to avoid impacting archaeological sites and deposits and are relatively small and will be minimally visible from the east side of Pali Kilo Road and Mokapu Road and from the ocean offshore; 2) the bunkers (Facilities 702, 703, 704, and 715) are covered under the Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities and the Navy/Marine Corps have met their Section 106 requirements and obligations for undertakings affecting World War II and Cold War Era ammunition storage facilities; 3) the area proposed for relocation of Facility 1180 is in an area that was previously disturbed and no archaeological sites or deposits have been recorded in this area; 4) the proposed relocation site is on the rear parking lot side of Facility 201 and will be minimally visible from the principle (front) side of the building; and 5) archaeological monitoring will be conducted in areas near archaeological sites or in areas with sand fill. If human remains are discovered, all work in the vicinity will stop and the remains will be stabilized and protected. Treatment will proceed under the authority of NAGPRA.

We request your review of and concurrence in the above determinations of effect and APE within 30 days of receipt of this letter. As defined in 36 CFR 800.5(c) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. As you can see below, MCB Hawaii is forwarding copies of this letter to the other consulting parties listed below as part of the Section 106 consultation process for this proposed undertaking. Thus, MCB Hawaii requests comments from the consulting parties listed below regarding the aforementioned determinations within 30 days of receipt of this letter. Should you or your staff have any questions or concerns please contact the MCB Hawaii Cultural Resources Management staff, Coral Rasmussen at 257-7134 or via email at coral.rasmussen@usmc.mil or Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil.

Sincerely,



W. M. ROWLEY
Major, U. S. Marine Corps
Director, Environmental Compliance and
Protection Department
By direction of the Commanding Officer

Enclosures:

- (1) Location of proposed new cottages (green) located in the western portion of Mokapu Peninsula aboard MCB Hawaii. The cottages shown in red have been removed from the project.
- (2) Single unit cottage representative floor plan.
- (3) Duplex cottage representative floor plan.
- (4) Representative Lodge plan; note location of Facility 1180.
- (5) Area proposed for relocation of Facility 1180 across from Facility 242 and behind Facility 201.
- (6) Location of World War II era small arms magazines near the proposed beach cottages.
- (7) Images of small arms magazine and inert storehouses located within the proposed APE for the beach cottage project.
- (8) Previous archaeological project in the Pali Kilo Area.
- (9) Albert Makinney house lot (Site 4610) contains a house, driveway and several stone walls. The concrete foundation from this residence had a wooden house with a generous lanai.
- (10) Mokapu Tract Subdivision House Lots from the 1930s overlaid with the proposed cottage locations.
- (11) Mokapu House lot owners from the 1930s.
- (12) Oblique aerial of Pali Kilo showing the Mokapu House Lot in 1941.
- (13) Previous archaeological surveys near the proposed relocation site.
- (14) Utilities Shop and Parachute Loft-Stowage building constructed 1941.
- (15) Facility 201, front view, showing that the shape and overall massing of the building has remained the same.
- (16) Proposed relocation site (dashed red polygon) on the north side of Facility 201, photo dated 26 Aug 1945, view to south.

Copy to:

Ms. Ah Lan Diamond 'Ohana
Ms. Nalani Olds, Olds 'Ohana
Ms. Delilah Ortiz; Ortiz 'Ohana.
Ms. Emalia Keohokalole, Keohokalole 'Ohana
Ms. Ella Paguyo, Paguyo 'Ohana
Mr. Norman Llamas, Prince Kuhio Hawaiian CC
Ms. Nau Kamalii, Boyd 'Ohana
Ms. Donna Ann Camvel, Paoa Kea Lono 'Ohana
Dr. Kamana'opono Crabbe, Office of Hawaiian Affairs
Mr. Cy Harris, Kekumano 'Ohana
Ms. Terrilee Napua Kekoolani Raymond, Kekoolani 'Ohana
Chair, Oahu Island Burial Council
Ms. Cathleen Mattoon, Koolauloa Hawaiian Civic Club
Mr. Clive Cabral, Temple of Lono
Ms. Kaleo Paik
Ms. Paulette Kaanohe Kaleikini, 'Ohana Keaweamahe
Mr. Kalahikiola Keliinoi, 'Ohana Keliinoi

Mr. Kala Waahila Kaleikini, 'Ohana Kaleikini
MR. Kilinahe Keliinai, 'Ohana Kahekilinuiahumanu
Mr. Kimball Kekaimalino Kaopio, 'Ohana Naihe
Mr. JR Keoneakapu Williams, 'Ohana Kapu
Mr. Norman Caceres, 'Ohana Huihui
Ms. Kiersten Faulkner, Historic Hawaii

References:

Barrera, William Jr.

- 1982 *Mokapu Peninsula [Marine Corps Air Station, Kaneohe Bay] Archaeological and Ethno-Historic Reconnaissance and Assessment*. Prepared for Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Chiniago Inc., Honolulu.

Clark, Jeffery

- 1980 *Mokapu Burial: Ulupa'u Dune Site, Kaneohe Marine Corps Air Station, Oahu*. Prepared for Kaneohe Marine Corps Air Station, Kaneohe Bay, Hawaii. Bishop Museum, Honolulu.

Drolet, Robert P., and Patricia A. Drolet

- 1996 *Archaeological Inventory Survey of Pali Kilo and Ulupa'u Crater Parcels Marine Corps Base Hawaii Kaneohe Bay, O'ahu, Hawai'i*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Pearl Harbor, Hawai'i. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Gosser, Dennis, Richard Nees, Stephan Clark, and Sara Collins

- 2015 *Archaeological Survey and Testing in Support of the Pali Kilo Beach Cottages Construction, Marine Corps Base, Hawaii, Kaneohe Bay, O'ahu, Hawai'i*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Pearl Harbor, Hawai'i. Pacific Consulting Services, Inc., Honolulu.

Environmental Compliance and Protection Department Marine Corps Base Hawaii

- 2011 *Historic Building Inventory: World War II Era Buildings aboard Marine Corps Base Hawaii, Kaneohe Bay*. Prepared by Environmental Compliance and Protection Department Marine Corps Base Hawaii, Kaneohe Bay, Hawai'i.

Jimenez, Joseph A., Thomas R. Wolforth, Robert B. Rechtman, and Alan E. Haun

- 1998 *Archaeological Monitoring of Trench Excavations for Phase II (KB35365MS) Repairs to Sanitary Sewer System, Marine Corps Base Hawaii, Kaneohe Bay, Oahu*. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Paul H. Rosendahl, Ph.D, Hilo, Hawaii.

Mason Architects

- 2014 *Historic Context and Building Inventory, Marine Corps Base Hawaii*. Prepared for Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Wil Chee - Planning, Inc., Helber Hastert and Fee, Planners, Mason Architects, Inc., Honolulu.

Masse, W. Bruce

- 1994 *Survey and Testing at Building 1614, in Conjunction with Beach Cottage Remodeling, at Pali Kilo on Marine Corps Air Station, Kaneohe Bay, Oahu*. Prepared for Marine Corps Base Hawaii. Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

Morrison, Alex, Chester Walker, and Matthew Bell

- 2010 *Archaeological Survey and Testing at Former Aircraft Control Squadron (MACS) II Facility, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii*. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Pearl Harbor, Hawai'i. International Archaeological Research Institute, Inc., Honolulu.

Nees, Richard, and Sara Collins

- 2009 Archaeological Monitoring in Support of Building 1614 (Beach Cottage) Repairs, Marine Corps Base Hawaii, Kaneohe Bay Island of O'ahu, State of Hawai'i. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Pearl Harbor, Hawai'i. Pacific Consulting Services, Inc., Honolulu.

O'Day, Patrick

- 2007 Archaeological Survey and Testing for the Pali Kilo II Historic Preservation Project, U.S. Marine Corps Base Hawaii, Kaneohe Bay (MCBH-KB), O'ahu Island, Hawai'i. Prepared for Social Research Pacific, Inc., under contract to U.S. Army Corps of Engineers, Honolulu District, Fort Shafter, Hawaii. International Archaeological Research Institute, Inc., Honolulu.

Prishmont, Laura, Jane Allen, and Stephan Clark

- 2001 Archaeological Monitoring in Support of the Base Realignment and Closure (BRAC) Program Relocating Barbers Point Naval Air Station Operations to Marine Corps Base Hawaii Kaneohe Bay, Oahu Island, Hawaii. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Ogden Environmental and Energy Services, Honolulu.

Rasmussen, Coral M.

- 2007 Archaeological Screening and Monitoring in a Portion of Marine Aircraft Control Squadron II (MACS II), MCBH Kaneohe Bay, O'ahu, Hawai'i. Prepared for U.S. Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor. International Archaeological Research Institute, Inc., Honolulu.

Roberts, Alice K. S., Katharine S. Brown, and Eric W. West

- 2002 Archaeological Monitoring and Sampling for Outside Cable Rehabilitation (OSCAR) Project, Marine Corps Base Hawaii (MCBH-KB), Kaneohe Bay, Ko'olaupoko District, Island of O'ahu, Hawai'i. Prepared for U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Garcia and Associates (GANDA), Kailua, O'ahu.

Schilz, Allan, James Landrum, and Jane Allen

- 1996 Archaeological Monitoring of KB-163MS, Repairs to Sanitary Sewer System (RESEW) at Marine Corps Base Hawaii Kaneohe Bay, O'ahu, Hawai'i. Ogden Environmental and Energy Services, Honolulu. Submitted to U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor.

Sholin, Carl, and Thomas Dye

- 2013 Archaeological Monitoring in Support of the Installation of Telecommunication Support Structure for the Outdoor Recreation Facility at Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. T.S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Tomonari-Tuggle, Myra

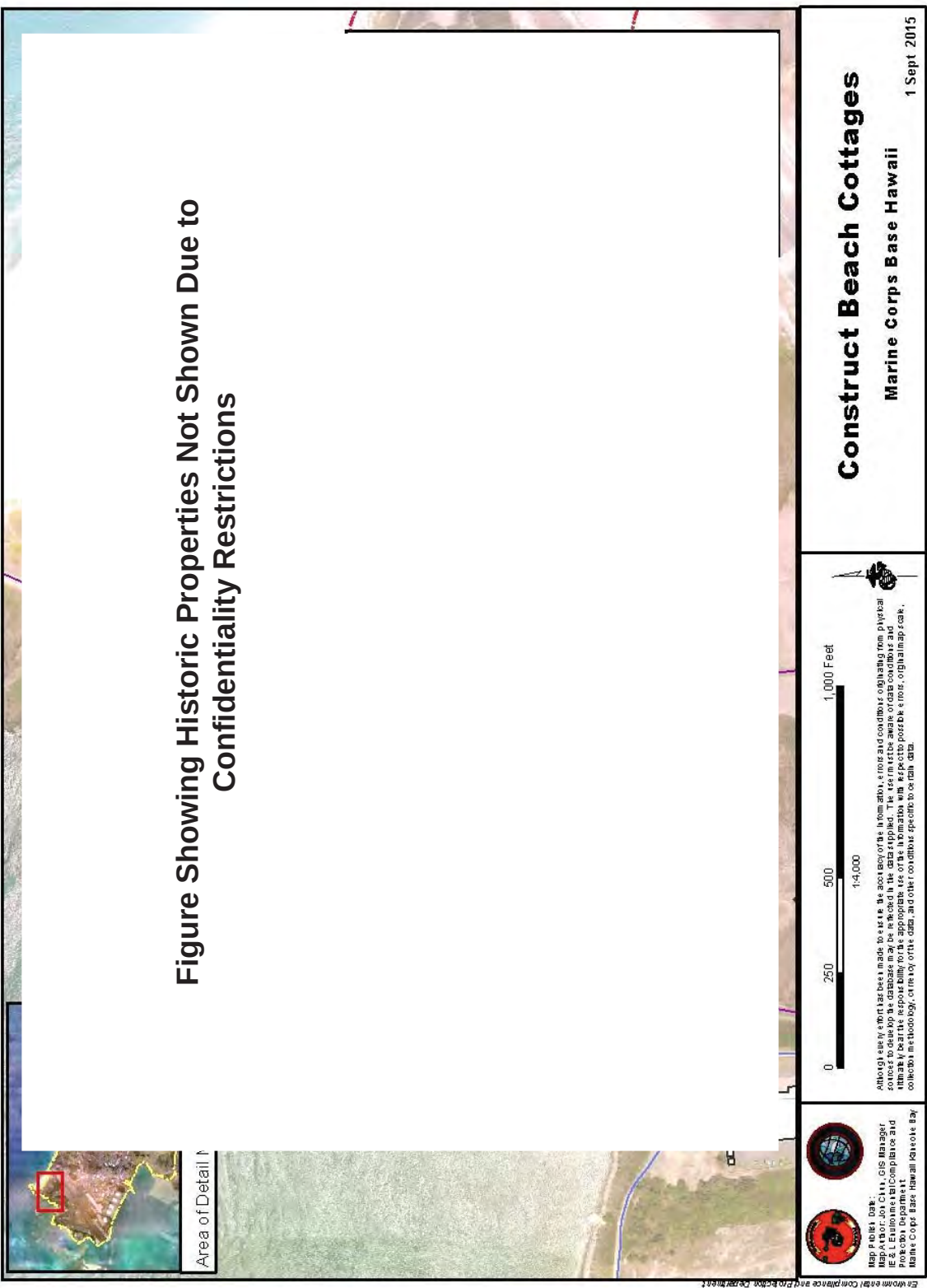
- 2014 *The Making of Mōkapu: A Paradise on the Peninsula. Archival and Ethnographic Research of Mōkapu Peninsula.* Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division, Pearl Harbor, Hawaii. International Archaeological Research Institute, Inc., Honolulu.

Tuggle, H. David

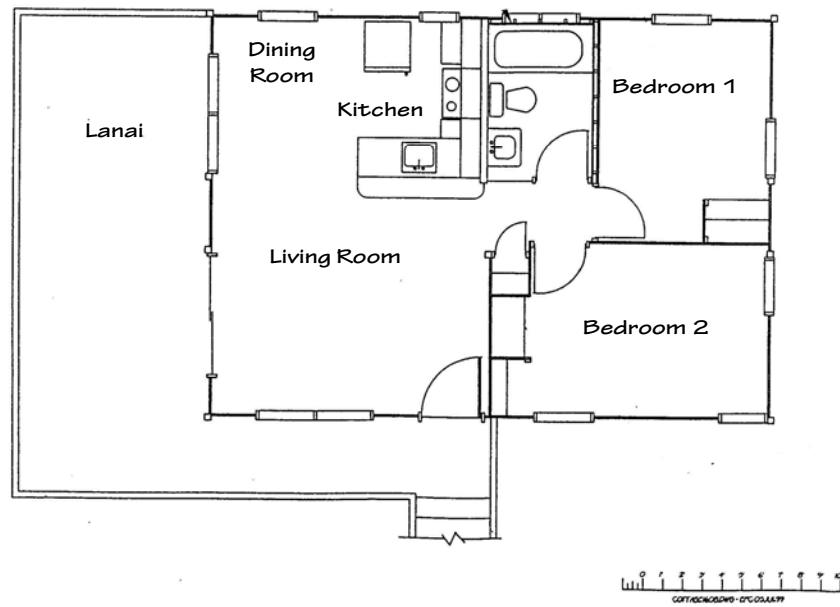
- 1986 *Historic Property Inventory, Marine Corps Air Station, Kaneohe Bay, History, Survey, and Site Descriptions.* Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, Hawaii.

Williams, Scott, and Tomasi Patolo

- 1998 *Subsurface Survey and Boundary Delimitation of the Mōkapu Burial Area Marine Corps Base Hawaii Kaneohe Bay, O'ahu, Hawaii in Conjunction with the Legacy Resource Management Program.* Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Ogden Environmental and Energy Services Co., Inc., Honolulu.



Enclosure 1. Location of proposed new cottages (green) located in the western portion of Mokuapu Peninsula aboard MCB Hawaii. The cottages shown in red have been removed from the project.

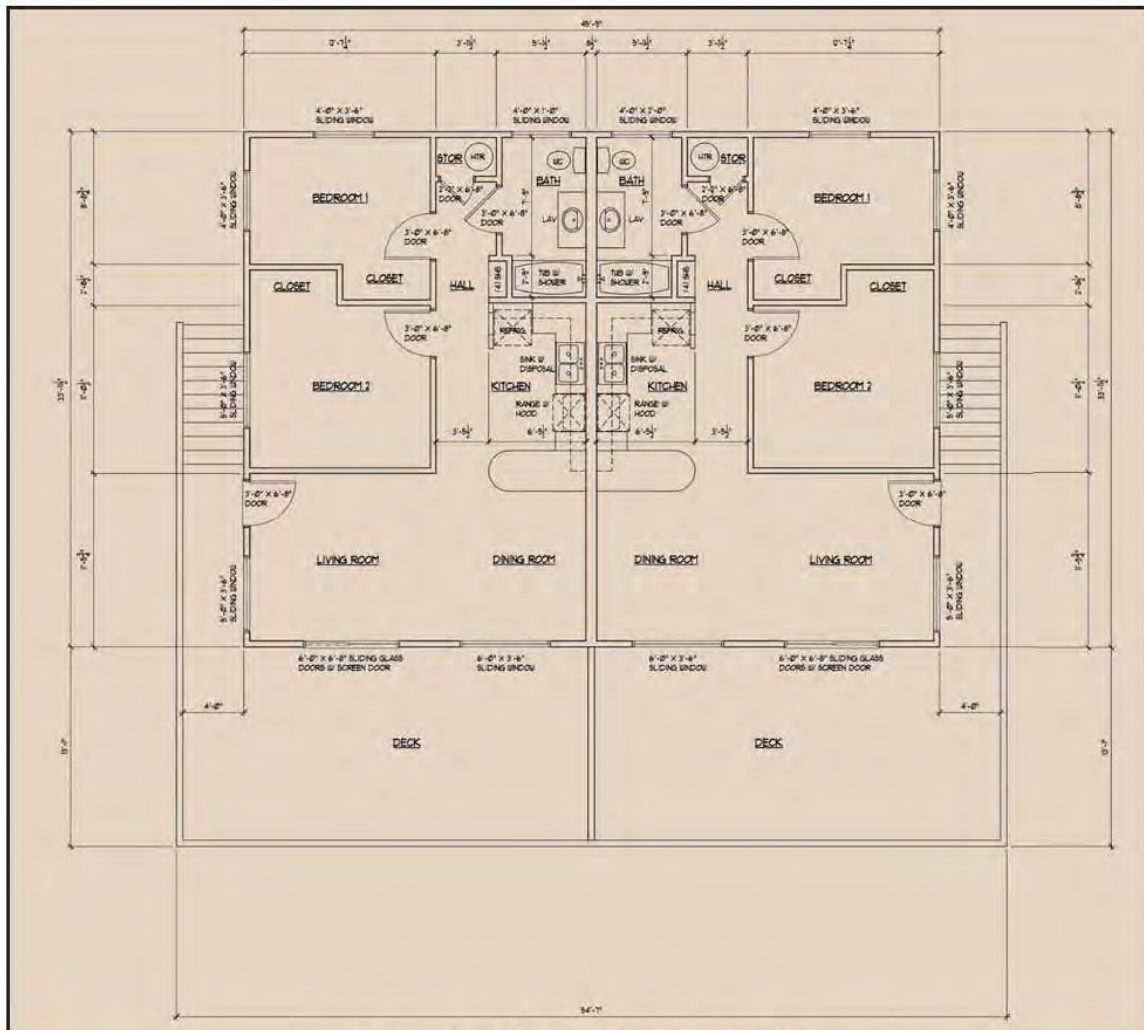


Representative Single Unit Floor Plan



Oblique view of Existing Cottage 1612

Enclosure 2. Single unit cottage representative floor plan.



Representative Duplex Cottage Floor Plan
(Existing Cottage 6171)

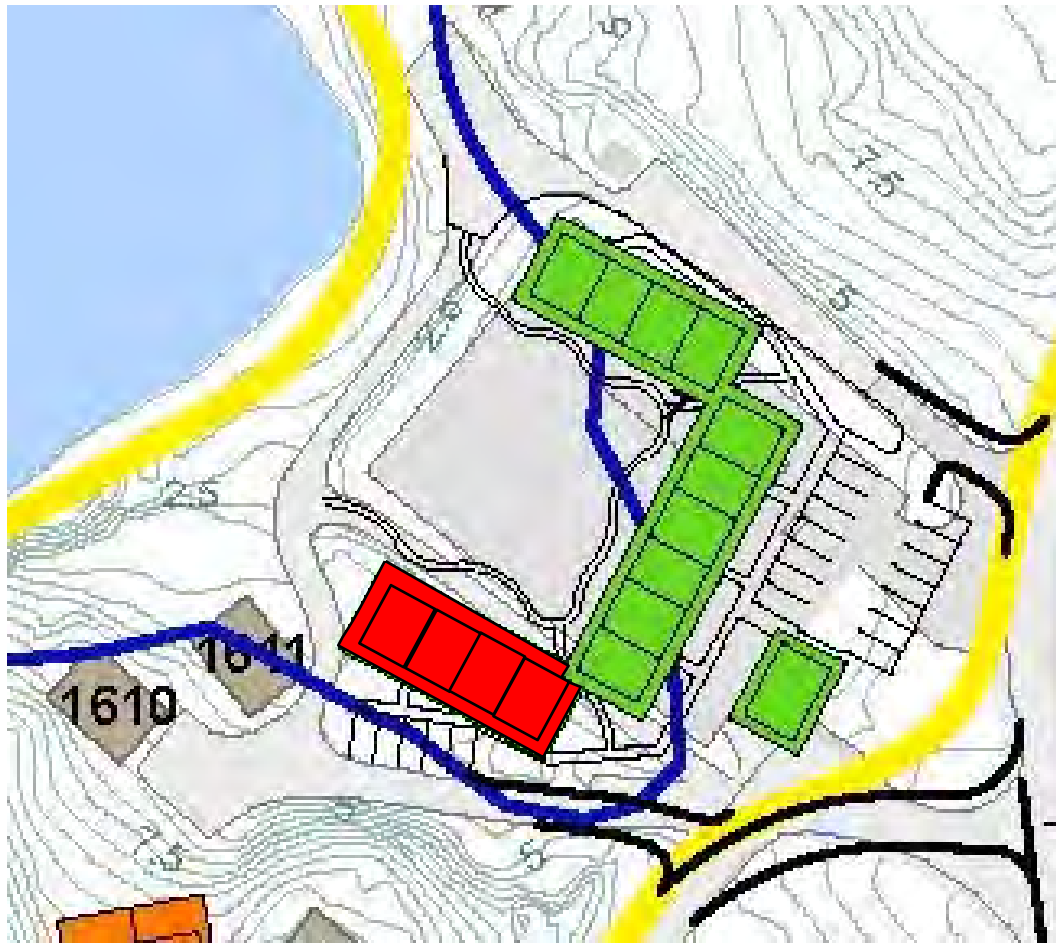


Oblique Aerial View of Existing Cottage 6171



Photo of Existing Duplex Cottage (6171)

Enclosure 3. Duplex cottage representative floor plan.



Example of Lodge Floor Plan showing removed southern wing.

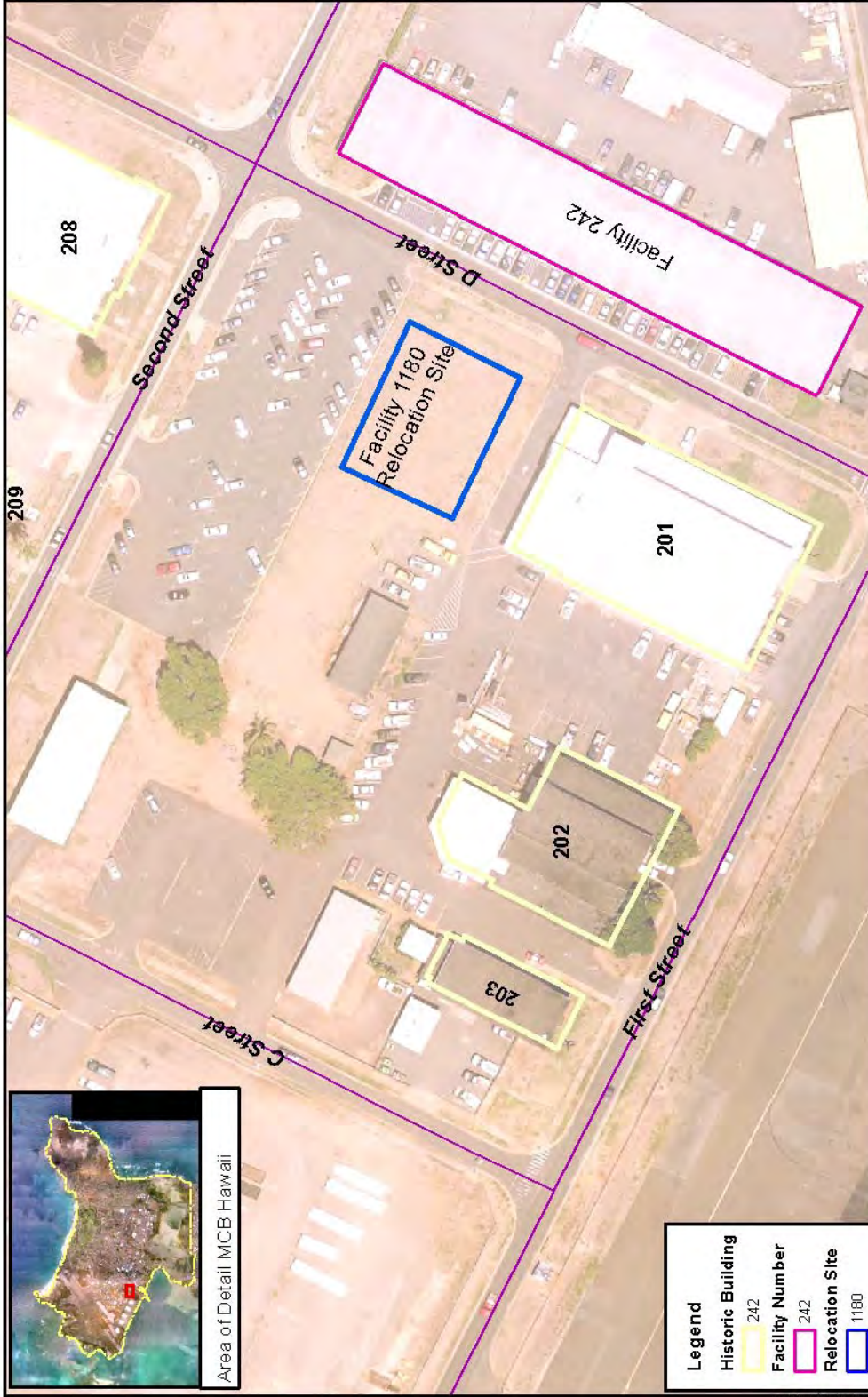


Oblique aerial of site location.



Generalized layout for Lodge.

Enclosure 4. Representative Lodge plan; note location of Facility 1180.



0 87.5 175 350 Feet

1:1,124

Although every effort has been made to ensure the accuracy of the information, errors and omissions originating from physical sources to develop the database may be included in the data supplied. The user must be aware of data conditions and collect data for the project. The user must be aware of the data conditions and collect data for the project. The user must be aware of the data conditions and collect data for the project.

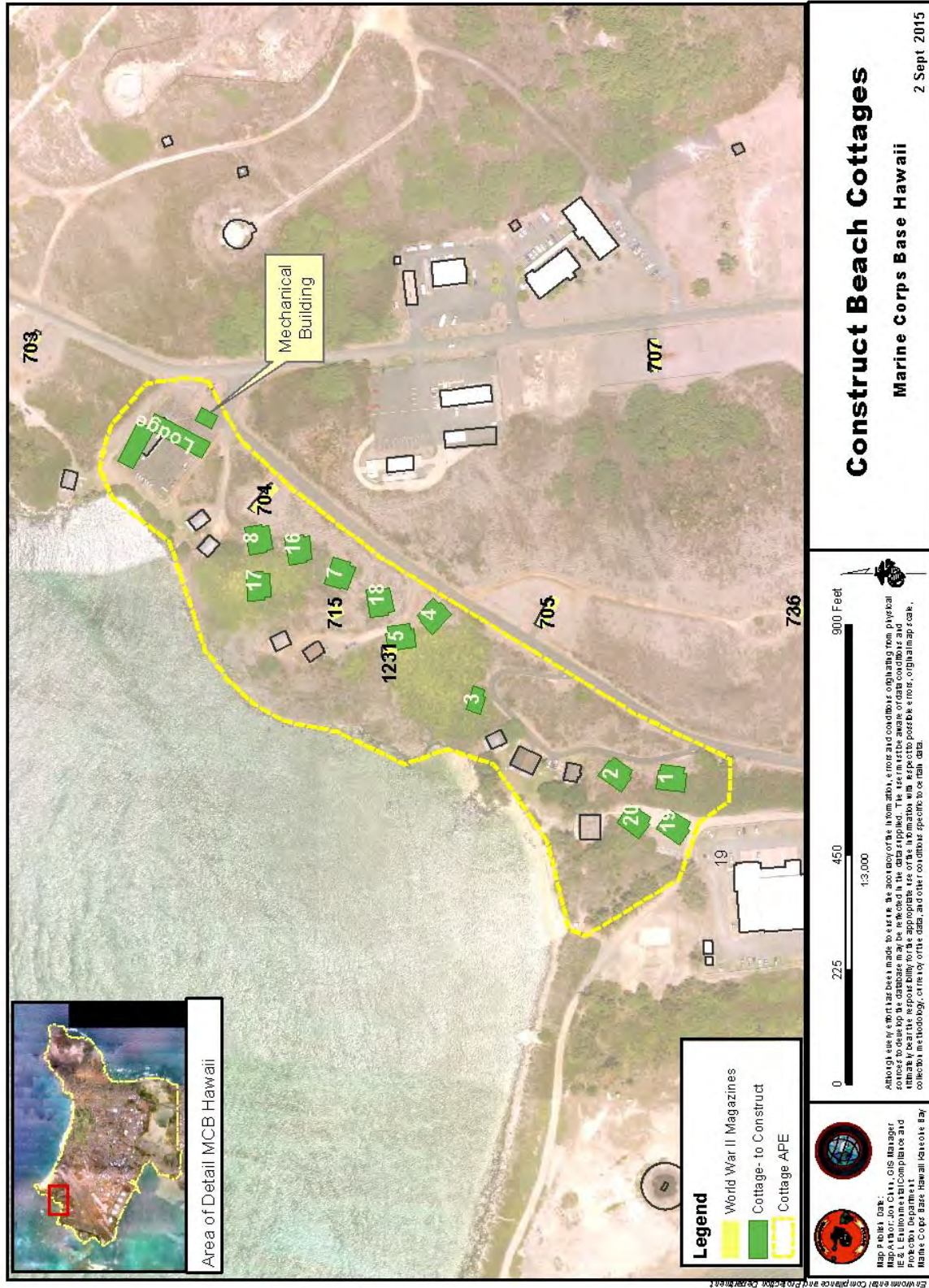
Map Data Date:
Map Author: Joe Chitt, GIS Manager
Map Editor: Joe Chitt, GIS Manager
Map Date: 3 Sept 2015

Construct Beach Cottages

Marine Corps Base Hawaii

3 Sept 2015

Enclosure 5. Area proposed for relocation of Facility 1180 across from Facility 242 and behind Facility 201.





Facility 704, small arms magazine.

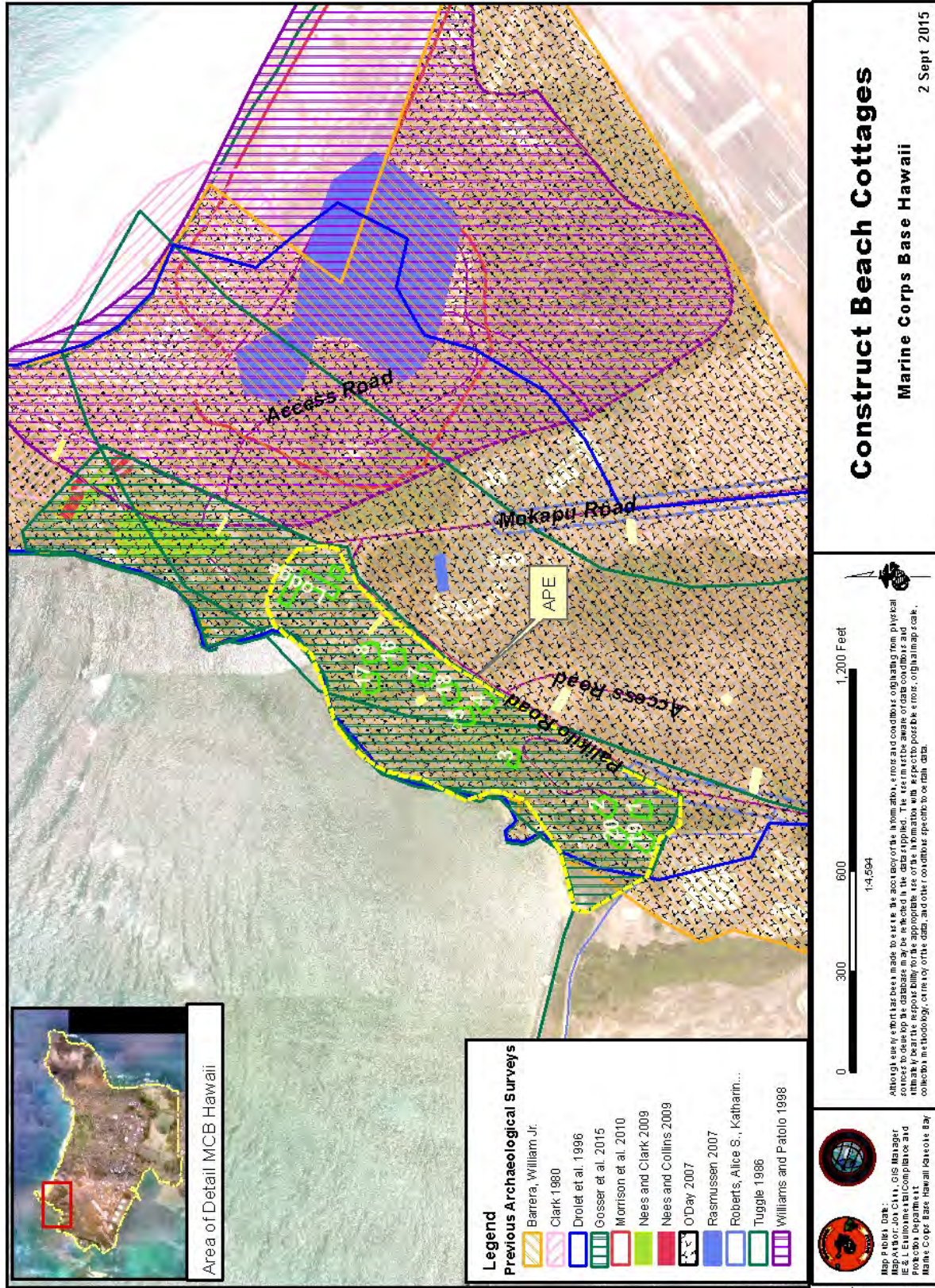


Facility 715, inert storehouse, door and interior space.



Facility 1231, inert storehouse, door and interior space.

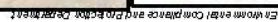
Enclosure 7. Images of small arms magazine and inert storehouses located within the proposed APE for the beach cottage project.



Enclosure 8. Previous archaeological project in the Pali Kilo Area.



Enclosure 9. Albert Mackinney house lot (Site 4610) contains a house, driveway and several stone walls. The concrete foundation from this residence had a wooden house with a generous lanai. Existing beach cottage (Facility 1605) visible in background.



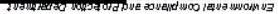
Enclosure 10. Mokapu Tract Subdivision House Lots from the 1930s overlaid with the proposed cottage locations.

Enclosure 11. Mokapu Houselot owners from the 1930s.

Cottage Number	Associated 1930s House Lot	House Lot information
1	71	Dr. Mori Hayashi, 1932-1941
2	72	Frances H. Holt, 1932-1941
3	74	Albert and Thelma Makinney, 1933-1941
4	76	Ida Busser King and William Heath Davis, 1936-1941
5	76	Ida Busser King and William Heath Davis, 1936-1941
7	78	Alfred and Mary Rex Brown, 1936-1941
8	80	Manuel Vasconcellos and Georginia Robello, 1936-1941
16	79	Marcus and Eunice McClendon, 1936
17	79	Marcus and Eunice McClendon, 1936
18	77	William and Maryann Williams, Sr., 1936-1941
19	70/71	Joseph and Geneva Musser, 1934-1936; and Dr. Mori Hayashi, 1932-1941
20	71	Dr. Mori Hayashi, 1932-1941
Lodge & Mechanical Building	82/83	Mary Beckley, 1932; and Gordon May, 1936



Enclosure 12. Oblique aerial of Pali Kilo showing the Mokapu House Lot in 1941.



Enclosure 13. Previous archaeological surveys near the proposed relocation site.



Enclosure 14. Utilities Shop and Parachute Loft-Stowage building constructed 1941 (photo dated 9 Sept 1941).



Enclosure 15. Facility 201, front view, showing that the shape and overall massing of the building has remained the same.



Enclosure 16. Proposed relocation site (dashed red polygon) on the north side of Facility 201, photo dated 26 Aug 1945, view to south.

DAVID Y. IGE
GOVERNOR OF HAWAII



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

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

November 9, 2015

W. M. Rowley, Major, U.S. Marine Corps
Director, Environmental Compliance and Protection Department
United State Marine Corps
Marine Corps Base Hawaii
Box 63002
Kaneohe Bay, HI 96863-3002

Log No. 2015.03930
Doc. No. 1511SL02
Archaeology, Architecture

Dear Major Rowley:

**SUBJECT: National Historic Preservation Act (NHPA) Section 106 Consultation –
Initiation of Consultation & Request for Concurrence of
“No Adverse Effect” – 5090 LE/154-15
Construct Beach Cottages Aboard MCB Hawaii
He‘eia Ahupua‘a, Ko‘olaupoko District, Island of O‘ahu
TMK: (1) 4-4-008:001**

Thank you for the opportunity to review this request from Marine Corps Base (MCB) Hawaii for consultation and concurrence with its determination of “no adverse effect” for the proposed project to construct beach cottages aboard MCB Hawaii. The project has been evaluated and determined to be an undertaking as defined in 36 CFR 800.16(y). We received this submittal on November 3, 2015. The proposed project is currently undergoing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA).

The area of potential effect (APE) is located in the area known as Pali Kilo in an area with existing beach cottages. The proposed work involves construction of 12 beach cottages and an L-shaped lodge complex. The number of cottages was reduced from 19 to 12 to avoid the eight archaeological sites identified during an archaeological inventory survey (Gosser et al. 2015); four traditional Hawaiian sites (Sites 2883, 5733, 7722, and 7724), and four historic-period sites (Sites 4610, 4611, 7725, and 7726).

Facility 1180 is within the footprint of the proposed lodge, and will be demolished and a new building will be constructed across from Facility 242 along D Street and behind Facility 201. Facility 1180 was built in 1959 and has been determined not eligible for listing in the National Register of Historic Places as it lacks Cold War significance (Mason Architects 2014). Facility 242 also has been determined not eligible, while Facility 201 (former Utilities Shop and Parachute Loft-Storage Building) has been determined eligible (Environmental 2011), but the current rear view overlooks a parking lot. Of the seven small arms magazines built in 1941 in Pali Kilo, only one (Facility 704) is located within the APE. Two inert storehouses constructed in 1941 (Facilities 715 and 1231) also are within the APE. The small arms magazines and inert storehouse are covered under the Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities; the Navy/Marine Corps have met their Section 106 requirements and obligations for these facilities. The buildings will be left in place, and no additional historic buildings are present within the APE (Environmental 2011; Mason Architects 2014).

Based on the information provided, MCB Hawaii has determined that the proposed project will result in “no adverse effect to historic properties” because (1) the cottages and lodge are being sited to avoid impacting the archaeological

sites and due to their small size will be minimally visible from the east side of Pali Kilo Road, Mokapu Road, and from offshore; (2) the small arms magazines and inert storehouses are covered under the Program Comment and the Navy/Marine Corps requirements and obligations have been met; (3) the area selected for the new Facility 1180 building is previously disturbed and no archaeological sites have been identified as present; (4) Facility 1180 will be minimally visible from the front; (5) archaeological monitoring will be conducted in areas near known archaeological sites and in areas with sand fill; and (6) if human remains are discovered, treatment will proceed under the authority of the Native American Graves Protection and Repatriation Act (NAGPRA).

Based on the information provided for our review, the State Historic Preservation Officer (SHPO) concurs with the determination of Marine Corps Base Hawaii that the proposed undertaking will result in **no adverse effect to historic properties**.

Please contact Anna Broverman, Architectural Historian, at (808) 692-8028 or at Anna.E.Broverman@hawaii.gov if you have any questions regarding architectural resources. Please contact Susan Lebo, Archaeology Branch Chief, at (808) 692-8019 or at Susan.A.Lebo@hawaii.gov if you have any questions regarding archaeological resources or this letter.

Aloha,

A handwritten signature in black ink, appearing to read "Alan S. Downer", followed by a long horizontal line extending to the right.

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: June Cleghorn, MCB Hawaii Cultural Resources Management (june.cleghorn@usmc.mil)
Coral Rasmussen, MCB Hawaii Cultural Resources Management (coral.rasmussen@usmc.mil)

Appendix E

Coastal Zone Management Act Consistency Determination



Ronald Sato

From: Suwa, Alan M CIV NAVFAC Pacific, EV <alan.suwa@navy.mil>
Sent: Thursday, April 28, 2016 8:42 AM
To: Ronald Sato; Chang, Connie M CIV NAVFAC PAC
Cc: Yamada, Ronald M CIV MARFORPAC
Subject: RE: Notification of Proposed Pali Kilo Beach Cottages Expansion Project as Navy/Marine Minimis Activities under CZMA

Follow Up Flag: Follow up
Flag Status: Completed

-----Original Message-----

From: Nakagawa, John D [mailto:john.d.nakagawa@hawaii.gov]
Sent: Thursday, April 28, 2016 7:57 AM
To: Suwa, Alan M CIV NAVFAC Pacific, EV
Subject: [Non-DoD Source] RE: Notification of Proposed Pali Kilo Beach Cottages Expansion Project as Navy/Marine Minimis Activities under CZMA

This acknowledges receipt of the notice of use of CZMA De Minimis List for the subject activity.

Thank you.

John Nakagawa
Hawaii Coastal Zone Management (CZM) Program
Email: john.d.nakagawa@hawaii.gov
Phone: (808) 587-2878

-----Original Message-----

From: Suwa, Alan M CIV NAVFAC Pacific, EV [mailto:alan.suwa@navy.mil]
Sent: Wednesday, April 27, 2016 7:46 PM
To: Nakagawa, John D <john.d.nakagawa@hawaii.gov>
Cc: Chang, Connie M CIV NAVFAC PAC <connie.chang@navy.mil>; Ronald Sato <rsato@hhf.com>
Subject: Notification of Proposed Pali Kilo Beach Cottages Expansion Project as Navy/Marine Minimis Activities under CZMA

Aloha Mr. Nakagawa,

The US Marine Corps is preparing an Environmental Assessment for the construction and operation of up to 12 new recreational beach cottages, and a Multi-unit complex (10 units) comprising a total of 33 new units at Marine Corps Base Hawaii at Kaneohe Bay. The Marine Corps Community Services presently operates the 14-unit The Cottages at Kaneohe Bay situated along a section of the western shoreline of Mokapu Peninsula referred to as Pali Kilo. The Proposed Action is needed to increase the number of recreational beach cottages at Pali Kilo to accommodate additional guests, meet current and future demand, and promote the overall morale and welfare of the U.S. Marine Corps and U.S. Department of Defense community. The project area is about 16.8 acres and located as shown in Enclosure (1). The proposed action will also include the demolition of existing Building 1180 and relocation of current uses to a new facility constructed elsewhere on the Base.

All required consultations and/or coordination with regulatory agencies will be completed prior to the Final EA and anticipated Finding of No Significant Impact. Consultation for Section 106 of the National Historic Preservation Act resulted in agreement with the State Historic Preservation Office to avoid historic properties which reduced the amount of proposed units from 49 total units (in 19 cottage buildings) to 33 units in (12 cottage buildings) and smaller Multi-unit complex.

The Proposed Action falls within the following items on the list of Navy/Marine Corps De Minimis Activities Under CZMA:

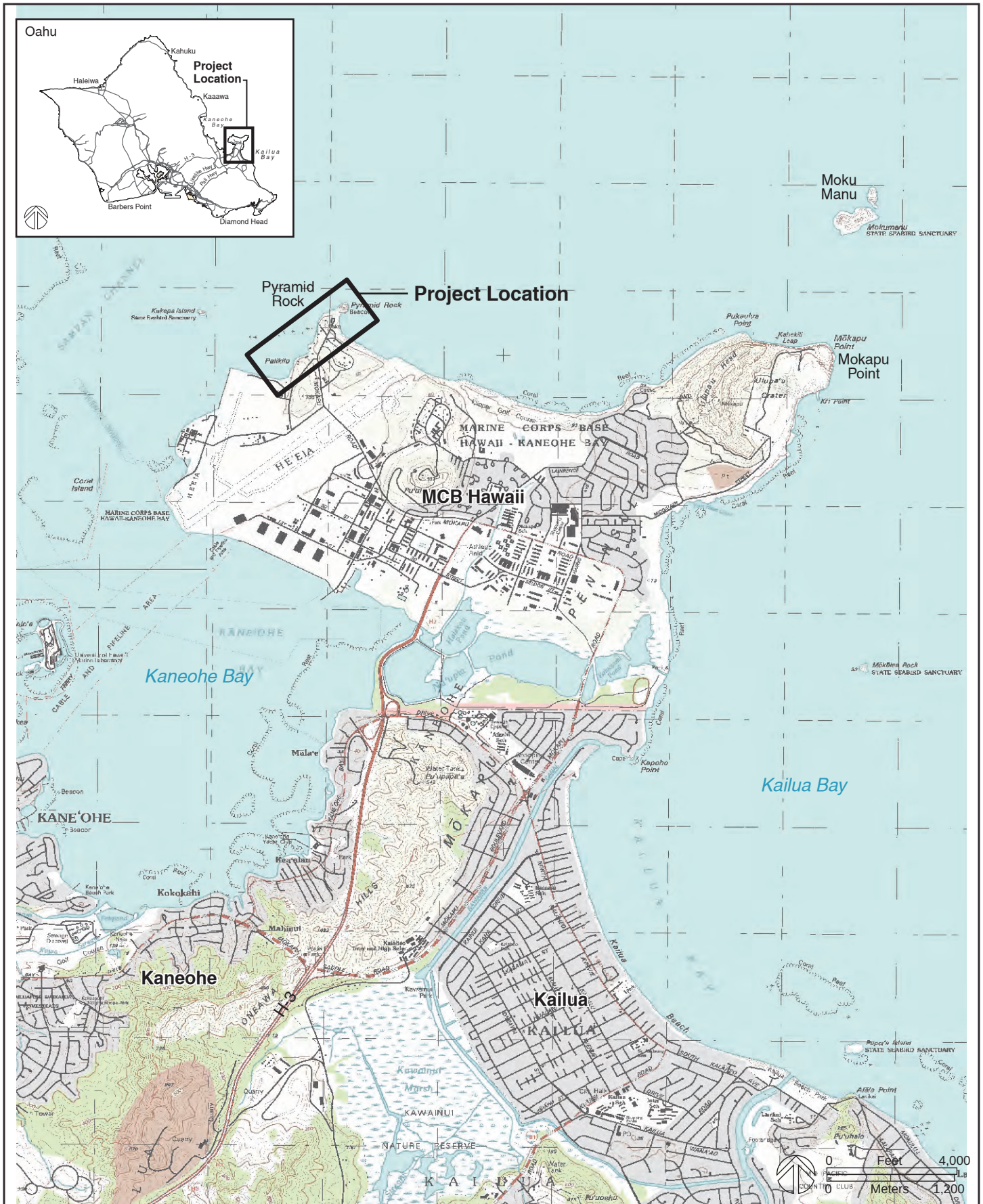
Item 1: Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.

Item 2: Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that uses rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.

Item 11: Demolition and disposal involving building or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.

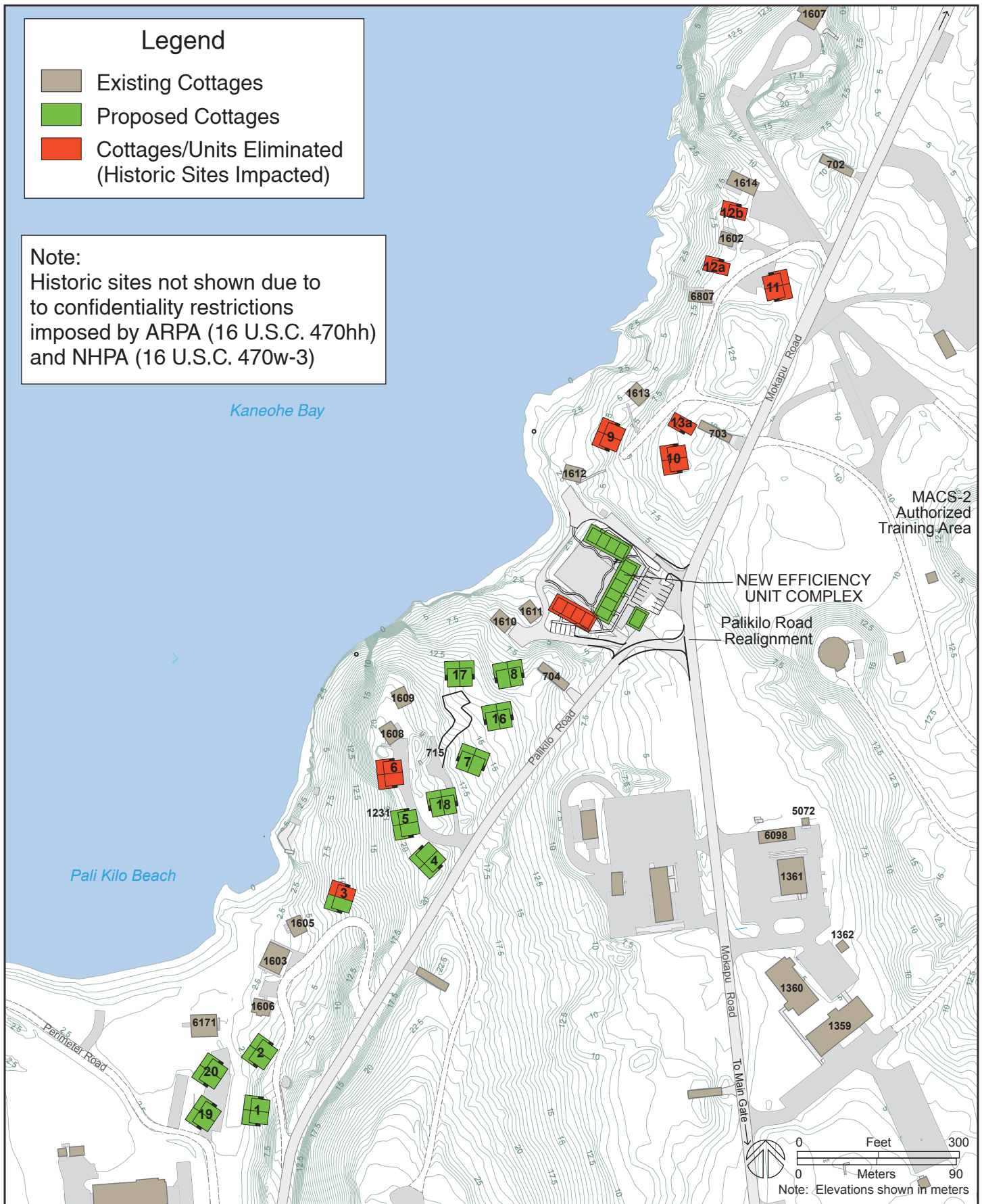
Per General Condition 16 of the list of De Minimis Activities Under CZMA, we are notifying you of the Marine Corps' use of the De Minimis for the Pali Kilo project. Please contact me if you have any questions by email or call.

V/r
Alan Suwa CIV
NAFAC Pacific
Environmental Planning
808 472 1450



Project Location Map
 MCB Hawaii Kaneohe Bay
 Pali Kilo Cottages Expansion Project

ENCLOSURE 1.



Mitigated Proposed Action

MCB Hawaii Kaneohe Bay
Pali Kilo Beach Cottages Expansion Project

