

Draft

ENVIRONMENTAL ASSESSMENT
for
HOME BASING OF THE MQ-9 MARINE UNMANNED AERIAL VEHICLE
SQUADRON AND
KC-130J MARINE AERIAL REFUELER TRANSPORT SQUADRON
AT MARINE CORPS BASE HAWAII KANEOHE BAY
OAHU, HAWAII

August 2022



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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron
Project Location:	Marine Corps Base (MCB) Hawaii Kaneohe Bay, Oahu, Hawaii
Affected Region:	City and County of Honolulu, Oahu, Hawaii
Action Proponent:	Headquarters Marine Corps, Deputy Commandant, Aviation
Point of Contact:	EV21 Project Mgr., MCB Hawaii Home Basing EA Email: NFPAC-Receive@navy.mil Naval Facilities Engineering Systems Command, Pacific 258 Makalapa Dr, Ste 100 Joint Base Pearl Harbor-Hickam, HI 96860-3134
Date:	August 2022

The Marine Corps has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality and Department of the Navy regulations, and Marine Corps Order 5090.2. The proposed action is to home base a Marine Corps MQ-9 Marine Unmanned Aerial Vehicle Squadron (with an anticipated 6 aircraft) and a KC-130J Aerial Refueler Transport Squadron (with an anticipated 15 aircraft) at MCB Hawaii Kaneohe Bay.

This EA evaluates the potential environmental impacts of the proposed action to the following resources: noise, air quality, water resources, cultural resources, biological resources, public health and safety, and transportation.

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Summary

S.1 Proposed Action

The proposed action is to home base a Marine Corps MQ-9 Marine Unmanned Aerial Vehicle (UAV) (hereinafter “MQ-9”) Squadron and a KC-130J Aerial Refueler Transport (hereinafter “KC-130J”) Squadron at Marine Corps Base (MCB) Hawaii Kaneohe Bay as part of Marine Aircraft Group 24 (MAG-24) (Figure S-1). Each squadron consists of personnel, aircraft, equipment, and supporting infrastructure.

S.2 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to enhance the airborne and intelligence capabilities of Marine Corps forces through the integration of multi-mission aerial refueler and transport capability and persistent intelligence, surveillance, and reconnaissance unmanned aerial systems, thereby enhancing the Marine Corps’ ability to transport Hawaii-based Marines and provide them real-time situational awareness to support the United States (U.S.) Indo-Pacific Command (USINDOPACOM). The need for home basing and operations of the MQ-9 and KC-130J squadrons is to extend the capability, versatility, and range of Hawaii-based Marine Corps and other forces through additional refueler, transport, intelligence, surveillance, and reconnaissance capabilities, in support of USINDOPACOM.

S.3 Alternatives Considered

Alternatives were analyzed based upon the following screening factors, which represent the minimum requirements for home basing the two squadrons:

1. The project location must be a military-controlled airfield in Hawaii.
2. The military-controlled airfield must meet minimum airfield infrastructure requirements (or have the space to construct or improve such infrastructure), including dedicated hangars for both aircraft types.
3. The military-controlled airfield must have access to established operating and training areas and airspace capable of supporting MQ-9 and KC-130J operations, and it must be compatible with existing base operations.
4. The military-controlled airfield must be capable of supporting long-term sustainment and maintenance for continued operations of MQ-9 and KC-130J aircraft.

Five military airfields were evaluated: MCB Hawaii Kaneohe Bay, Joint Base Pearl Harbor-Hickam (JBPHH), U.S. Coast Guard Air Station (USCG) Barbers Point, Wheeler Army Airfield, and Dillingham Military Reservation. Only MCB Hawaii Kaneohe Bay meets all the minimum requirements and is carried forward for evaluation. On MCB Hawaii Kaneohe Bay, various laydowns of aircraft and support facilities were evaluated, with one configuration carried forward for analysis.

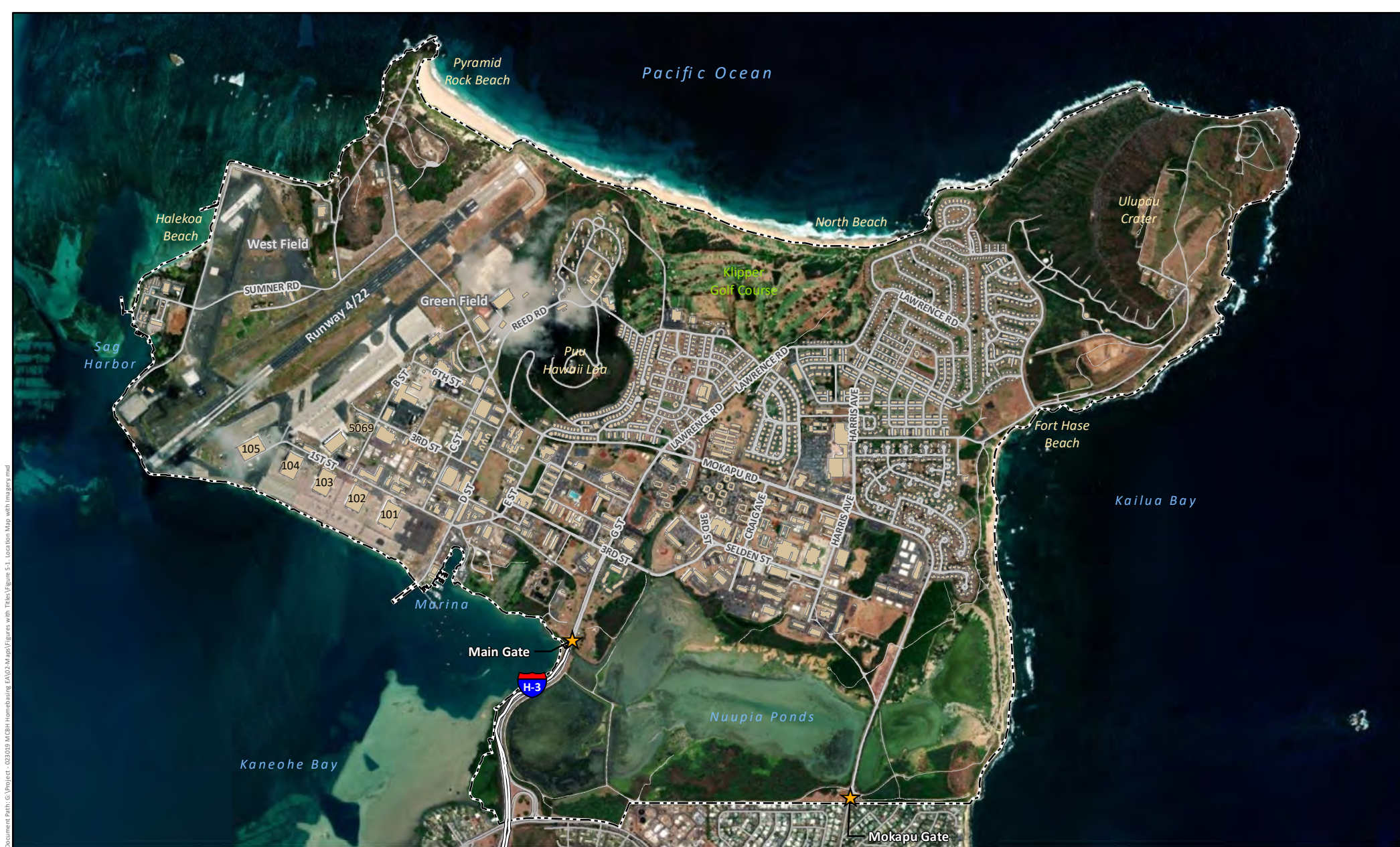
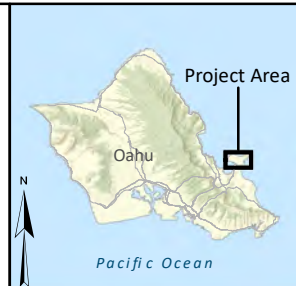


Figure S-1. Project Location Map

MCB Hawaii Kaneohe Bay Boundary
★ Gate
 Interstate
 Road
 Building

0 1,000 2,000 Feet



Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

Under the No-Action Alternative, the proposed action would not occur. MQ-9 and KC-130J squadrons would not be home based at MCB Hawaii Kaneohe Bay. The No-Action Alternative does not meet the purpose of and need for the proposed action, because it would not enable the Hawaii-based Marine Corps to enhance aerial refueling, transport and intelligence, surveillance, and reconnaissance capabilities to support the Combatant Commander in the Pacific. It is, however, included as a baseline from which to compare the impacts of the proposed action.

S.4 Summary of Potential Environmental Consequences of the Alternatives and Major Mitigating Actions

Table S-1 presents a summary of potential environmental impacts associated with the proposed action.

S.5 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps is soliciting public and agency input regarding the proposed action through publication of the Environmental Assessment (EA) and through the National Historic Preservation Act (NHPA) Section 106 and Section 110 consultation process. The Draft EA and anticipated Finding of No Significant Impact (FONSI) are available on the State of Hawaii's Environmental Review Program (ERP) website: <https://planning.hawaii.gov/erp/> and the MCB Hawaii website: <https://www.mcbhawaii.marines.mil/Resources/Featured-Information/MQ9-KC130>. All comments received during the public comment period will be fully considered by the Marine Corps prior to rendering a decision on the proposed action.

In accordance with Section 106 of the NHPA, the Marine Corps is consulting with the Hawaii State Historic Preservation Division (SHPD), Native Hawaiian Organizations (NHOs), interested parties, and the public regarding a determination of adverse effects to historic properties resulting from the proposed action. MCB Hawaii initiated Section 106 consultation with the Hawaii SHPD for the undertaking on 6 January 2022 and is conducting Section 110 consultation with the National Park Service. MCB Hawaii determined the proposed undertaking would result in an adverse effect on historic properties, and in a letter dated 7 February 2022, the SHPD concurred with the determination that the project would result in adverse effects to the Naval Air Station (NAS) Kaneohe Historic Aviation District. The Section 106 consultation process included meetings on 13 January, 10 March, 14 April, 12 May, 9 June, and 14 July 2022. Consultations will continue through the fall of 2022 as a Memorandum of Agreement (MOA) is developed to resolve adverse effects to historic properties. The Advisory Council on Historic Preservation (ACHP) declined the invitation to participate in the Section 106 consultation process.

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps is conducting informal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts to ESA-listed species. The Marine Corps determined the proposed action may affect, but is not likely to adversely affect, ESA-listed species or has no effect on ESA-listed species.

The proposed action falls under the Navy's Coastal Zone Management Act (CZMA) De Minimis Activities List (State of Hawaii CZMA letter, dated 9 July 2009). The Marine Corps will notify the State of Hawaii Office of Planning and Sustainable Development, Planning Division, regarding its determination.

Table S-1 Summary of Potential Impacts

<i>Resources</i>	<i>Alternative 1</i>
Noise	<ul style="list-style-type: none"> Less than significant impacts. Minimal increase in average noise contours from aircraft operations.
Air Quality	<ul style="list-style-type: none"> Less than significant impacts. Construction and operational activities would only minimally increase greenhouse gas emissions and would not substantially contribute to global warming.
Water Resources	<ul style="list-style-type: none"> Less than significant impacts to groundwater, surface water, wetlands, and floodplains.
Cultural Resources	<ul style="list-style-type: none"> Less than significant impacts to archaeological resources. Impacts to archaeological sites would be minimized through archaeological monitoring. Less than significant impacts to historic resources. Impacts to these resources would be reduced through incorporation of mitigation measures developed in the NHPA Section 106 and Section 110 process.
Biological Resources	<ul style="list-style-type: none"> Less than significant impacts to vegetation, wildlife, critical habitat, and ESA-listed species. The proposed action either may affect, but is not likely to adversely affect, ESA-listed species or has no effect on ESA-listed species.
Public Health and Safety	<ul style="list-style-type: none"> Less than significant impacts.
Transportation	<ul style="list-style-type: none"> Less than significant impacts to traffic, bus routes, and bikeways.

Notes: CFR = Code of Federal Regulations; ESA = Endangered Species Act; MOA = Memorandum of Agreement; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act.

Environmental Assessment

Marine Corps Base Hawaii Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron at Marine Corps Base Hawaii Kaneohe Bay

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Abbreviations and Acronyms

Acronym	Definition	Acronym	Definition
%	Percent	FY	Fiscal Year
ACHP	Advisory Council on Historic Preservation	GCS	Ground Control Station
AICUZ	Air Installations Compatible Use Zone	GDT	Ground Data Terminal
APE	Area of Potential Effects	GHG	Greenhouse Gas
BASH	Bird/Wildlife Aircraft Strike Hazard	GSE	Ground Support Equipment
BMP	Best Management Practice	HAR	Hawaii Administrative Rule
CAA	Clean Air Act	HDOT	Hawaii Department of Transportation
CEQ	Council on Environmental Quality	Hz	Hertz
CFR	Code of Federal Regulations	ICRMP	Integrated Cultural Resources Management Plan
CO	Carbon Monoxide	IDA	International Dark-Sky Association
CO ₂	Carbon Dioxide	INRMP	Integrated Natural Resources Management Plan
CWA	Clean Water Act		
CZMA	Coastal Zone Management Act	JBPHH	Joint Base Pearl Harbor- Hickam
dB	Decibel	LID	Low Impact Development
dBA	A-weighted Decibel	LOS	Level of Service
DNL	Day-Night Average Sound Level	MAG-24	Marine Aircraft Group 24
DoD	United States Department of Defense	Marine Corps	United States Marine Corps
DOH	Hawaii State Department of Health	MBTA	Migratory Bird Treaty Act
EA	Environmental Assessment	MCAS	Marine Corps Air Station
ECU	Environmental Control Unit	MCB	Marine Corps Base
EO	Executive Order	MCO	Marine Corps Order
ERP	Environmental Review Program	MOA	Memorandum of Agreement
ESA	Endangered Species Act	MOVES3	Motor Vehicle Emission Simulator
ESQD	Explosive Safety Quantity Distance	MS4	Municipal Separate Storm Sewer System
FAA	Federal Aviation Administration	NAAQS	National Ambient Air Quality Standards
FEMA	Federal Emergency Management Agency	NAGPRA	Native American Graves Protection and Repatriation Act
FONSI	Finding of No Significant Impact	NAS	Naval Air Station
		NAVFAC	Naval Facilities Engineering Systems Command

Acronym	Definition	Acronym	Definition
NEPA	National Environmental Policy Act	SO ₂	Sulfur Dioxide
NHL	National Historic Landmark	SWPPP	Storm Water Pollution Prevention Plan
NHO	Native Hawaiian Organization	TCP	Traditional Cultural Property
NHPA	National Historic Preservation Act	U.S.	United States
NOAA	National Oceanic and Atmospheric Administration	UAV	Unmanned Aerial Vehicle
NO _x	Nitrogen Oxides	UFC	Unified Facilities Criteria
NPDES	National Pollutant Discharge Elimination System	USCG	United States Coast Guard
NRHP	National Register of Historic Places	USDA	U.S. Department of Agriculture
PM _{2.5}	Particulate Matter Less Than or Equal to 2.5 Micrometers in Diameter	USEPA	United States Environmental Protection Agency
PM ₁₀	Particulate Matter Less Than or Equal to 10 Micrometers in Diameter	USFWS	United States Fish and Wildlife Service
PSD	Prevention of Significant Deterioration	USINDOPACOM	United States Indo-Pacific Command
SHPD	State Historic Preservation Division	VMGR	Marine Aerial Refueler Transport Squadron
		VMU	Marine Unmanned Aerial Vehicle Squadron
		VOC	Volatile Organic Compound
		WMA	Wildlife Management Area
		WWII	World War II

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The 2018 National Defense Strategy redirected the Marine Corps mission from countering violent extremists in the Middle East to Great-Power/Peer Competition, with special emphasis on the Indo-Pacific. This shift in mission requires adjustments in how the Marine Corps organizes, trains, and equips its forces to support United States (U.S.) combatant commanders.

The Marine Corps proposes to home base a Marine Corps MQ-9 Marine Unmanned Aerial Vehicle (UAV) (hereinafter “MQ-9”) Squadron and a KC-130J Marine Aerial Refueler Transport (hereinafter “KC-130J”) Squadron at Marine Corps Base (MCB) Hawaii Kaneohe Bay. Each squadron consists of personnel, aircraft, equipment, and supporting facilities. MQ-9 activities would consist of reconnaissance, communication, and sensing missions to support operational forces as they train for various warfare functions. KC-130J activities would consist of transport and aerial refueling operations. The two new squadrons would join the Hawaii-based Marine Aircraft Group 24 (MAG-24).

Headquarters Marine Corps, Deputy Commandant, Aviation is the action proponent for this proposed action. The Marine Corps prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), U.S. Department of the Navy regulations (32 CFR part 775), and Marine Corps Order (MCO) 5090.2.

1.2 Location

The proposed action is located on the western shore of MCB Hawaii Kaneohe Bay, on the island of Oahu, in the state of Hawaii (Figure 1-1). MCB Hawaii Kaneohe Bay encompasses 2,951 acres on Oahu’s eastern shore at Mokapu Peninsula. Mokapu Peninsula is bounded by the waters of Kaneohe Bay on the west, the Pacific Ocean to the north, Kailua Bay to the east, and residential development to the south. Kailua and Kaneohe are the communities nearest to the base. MCB Hawaii Kaneohe Bay is home to MAG-24 and its subordinate aviation squadrons, a Marine Corps Operational Support Airlift squadron, the Navy’s Fleet Logistics Support squadron 51 (VR-51), the Navy Helicopter Maritime Strike squadron 37 (HSM-37), and a two-aircraft detachment of Navy P-8As. MAG-24 is the primary Marine Corps aviation asset in the Hawaiian Islands, responsible for supporting training and exercises throughout the Pacific theater. MAG-24 was activated on Oahu in 1942 and has been continuously based at MCB Hawaii Kaneohe Bay since 1968. MCB Hawaii Kaneohe Bay has historic properties, including a line of hangars between 1st Street and Bravo Ramp that are contributing resources to the National Register of Historic Places (NRHP)-eligible Aviation District (Figure 1-2). Additionally, MCB Hawaii Kaneohe Bay has a National Historic Landmark (NHL) District associated with the World War II (WWII) attacks on Hawaii.

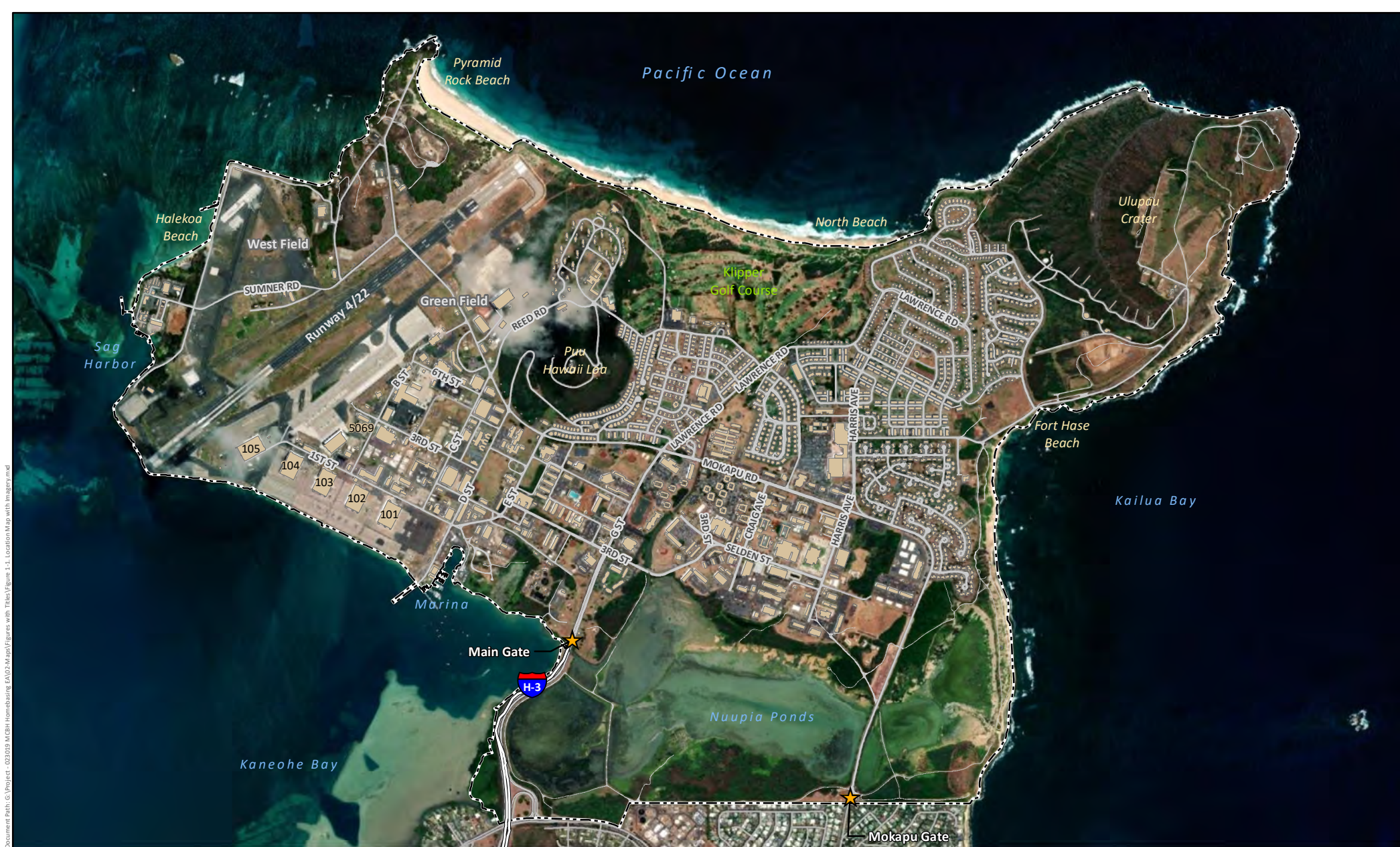


Figure 1-1. Project Location Map

	MCB Hawaii Kaneohe		Interstate
	Bay Boundary		Road
	Gate		
	Building		

0 1,000 2,000 Feet

Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

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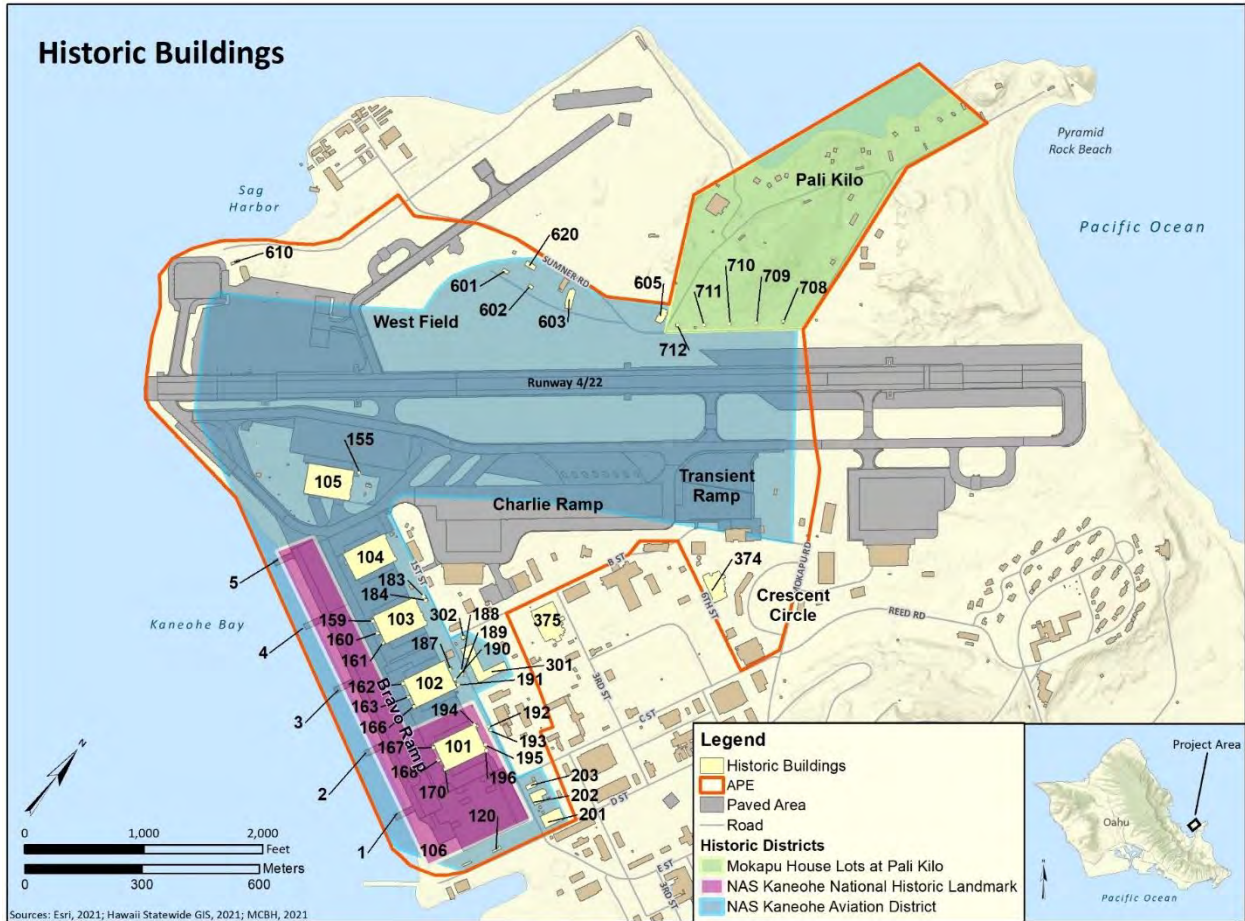


Figure 1-2 Historic Properties Including Historic Districts at MCB Hawaii Kaneohe Bay

1.3 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to enhance the airborne and intelligence capabilities of Marine Corps forces through the integration of multi-mission aerial refueler and transport capability and persistent intelligence, surveillance, and reconnaissance unmanned aerial systems, thereby enhancing the Marine Corps' ability to transport Hawaii-based Marines and provide them real-time situational awareness, to support USINDOPACOM. The need for home basing and operations of the MQ-9 and KC-130J is to extend the capability, versatility, and range of Hawaii-based Marine Corps and other forces through additional refueler, transport, intelligence, surveillance, and reconnaissance capabilities in support of USINDOPACOM.

1.4 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the proposed action. The process for identifying resources analyzed in this EA is summarized in Chapter 3, *Introduction*. The environmental resources analyzed in detail include:

- Noise
- Air Quality
- Water Resources
- Cultural Resources
- Biological Resources
- Public Health and Safety
- Transportation

1.5 Relevant Laws and Regulations

The Marine Corps has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the proposed action (see Appendix A).

1.6 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps is soliciting public and agency input regarding the proposed action through publication of the EA and through the National Historic Preservation Act (NHPA) Section 106 consultation process. The Draft EA and anticipated Finding of No Significant Impact (FONSI) are available on the State of Hawaii's Environmental Review Program (ERP) website: <https://planning.hawaii.gov/erp/> and the MCB Hawaii website: <https://www.mcbhawaii.marines.mil/Resources/Featured-Information/MQ9-KC130>. All comments received during the public comment period will be fully considered by the Marine Corps prior to rendering a decision on the proposed action. Agency correspondence is provided in Appendix B.

In accordance with Section 106 of the NHPA, the Marine Corps is consulting with the State Historic Preservation Division (SHPD), Native Hawaiian Organizations (NHOs), interested parties, and the public regarding a determination of adverse effects to historic properties resulting from the proposed action. MCB Hawaii initiated Section 106 consultation with the Hawaii SHPD for the undertaking on 6 January 2022 and is conducting Section 110 consultation with the National Park Service. MCB Hawaii determined

the proposed undertaking would result in an adverse effect on historic properties, and, in a letter dated 7 February 2022, the SHPD concurred with the determination the project would result in adverse effects to the Naval Air Station (NAS) Kaneohe Historic Aviation District. The Section 106 consultation process included meetings on 13 January, 10 March, 14 April, 12 May, 9 June, and 14 July 2022. Consultations will continue through the fall of 2022 as a Memorandum of Agreement (MOA) is developed to resolve adverse effects to historic properties. The Advisory Council on Historic Preservation (ACHP) declined the invitation to participate in the Section 106 consultation process. Section 106 consultation correspondence is in Appendix C.

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps is conducting informal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts to ESA-listed species. The Marine Corps determined the proposed action may affect, but is not likely to adversely affect, ESA-listed species or has no effect on ESA-listed species (see ESA Section 7 consultation correspondence in Appendix D).

The proposed action falls under the Marine Corps' Coastal Zone Management Act (CZMA) De Minimis Activities List (State of Hawaii CZMA letter, dated 9 July 2009). The Marine Corps will notify the State of Hawaii Office of Planning and Sustainable Development, Planning Division, regarding its determination (see CZMA correspondence in Appendix E).

1.7 Permits and Approvals

Permits and approvals necessary for the proposed action consist of an amendment to the installation National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit, which will be processed through the Hawaii Department of Health. This is required for construction projects that exceed 1 acre in size.

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2 Proposed Action and Alternatives

2.1 Proposed Action

The proposed action is to home base an MQ-9 UAV squadron and a KC-130J squadron at MCB Hawaii Kaneohe Bay. Under the proposed action, the Marine Corps would replace and modify existing hangars and supporting infrastructure, perform aviation maintenance, provide training for operators and maintainers, conduct approximately 3,000 MQ-9 and 5,280 KC-130J annual aircraft operations, and station approximately 676 personnel (229 MQ-9 and 447 KC-130J personnel) plus dependents at MCB Hawaii Kaneohe Bay.



Photo: MQ-9 Aircraft



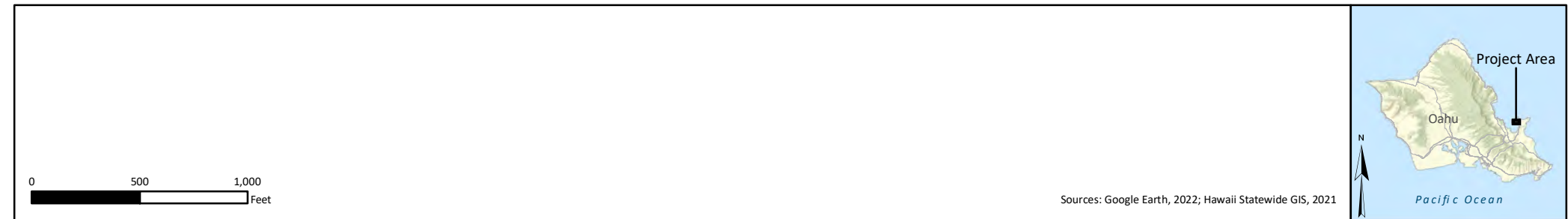
Photo: KC-130J Aircraft

The squadrons associated with the proposed action would be the Marine Unmanned Aerial Vehicle Squadron (VMU) for MQ-9 aircraft and the Marine Aerial Refueler Transport Squadron (VMGR) for KC-130J aircraft. The proposed action would house the MQ-9 squadron in Hangar 102, house the KC-130J squadron in Hangar 6886 (currently occupied by an MV-22 squadron), and demolish and reconstruct Hangar 103 as the replacement hangar for the MV-22 squadron. Figure 2-1 provides a conceptual overview of the proposed action; more detailed figures for action alternatives are presented in Section 2.2, *Alternatives Development*. The proposed action would be implemented over a 5-year period from 2023 to 2027. Temporary facilities such as trailers, equipment storage, and communications connections would be located within the project footprint near the hangars and on the parking aprons and ramps to allow for partial operation of the squadrons while construction of permanent facilities are underway. MQ-9 aircraft would park on Bravo Ramp near Hangar 102, and KC-130J aircraft would park on the north end of Charlie Ramp near the transient ramp. The temporary facilities would not be sufficient to support the full set of aircraft, personnel, and operations associated with the proposed action. Home basing the full complement of MQ-9 and KC-130J aircraft, associated personnel and dependents, and all infrastructure support is anticipated to be complete by 2027.

Squadron personnel and dependents would be housed in on-base housing and off base in the community consistent with existing housing practices for military personnel at MCB Hawaii Kaneohe Bay. No additional housing would be needed for the proposed action.



Figure 2-1. Conceptual Overview of the Proposed Action Location



2.1.1 Facilities

Table 2-1 lists the construction projects for the proposed action. Several of the facilities that are part of the proposed action are historic, including Hangar 102 (under construction in 1941), Hangar 103 (built in 1941), and the three ancillary aircraft spares storage buildings, Buildings 159, 160, and 161 (built in 1942) and Buildings 183 and 184 (built in 1942–1943) (see Figure 1-2). Most of the proposed construction would occur on previously developed, paved areas. Approximately 4.25 acres of proposed construction would occur in undeveloped landscaped areas.

2.1.1.1 Hangars

Hangars provide shelter for servicing and repairing aircraft. Hangars typically include a bay high enough for sheltering aircraft and conducting maintenance and repair. They also provide space for crew, equipment, and administration. There are four types of standard U.S. Department of Defense (DoD) hangars (Types I–IV). Type I hangars are primarily used for compact Navy carrier aircraft such as MH-60s; Type II hangars primarily support Marine Corps aircraft and are used to house aircraft such as the MV-22 and KC-130J; Type III hangars are designed for patrol (P-8A) and large transport (C-40) aircraft; and Type IV hangars are used for large UAVs. MCB Hawaii Kaneohe Bay Hangars 101–105 (see Figure 2-1) were constructed between 1941 and 1943 to support seaplanes assigned to the installation and are not compliant with Unified Facilities Criteria (UFC) 4-211-01, *Aircraft Maintenance Hangars* (DoD, 2021). Moreover, they are undersized for current aircraft such as the C-40 and KC-130J, and the orientation of their bay doors away from the main taxiways makes them inefficient for current operations. Hangar 101 is currently being renovated and will be used for a Navy Helicopter squadron and to house the Fleet Readiness Center. A portion of Hangar 102 was recently renovated and houses an unmanned aerial squadron. Hangar 103 houses the Navy helicopter squadron until the Hangar 101 modifications are complete. Hangar 104 houses a P-8A aircraft support facility and supports the Fleet Readiness Center until the Hangar 101 modifications are complete. Hangar 105 is used as “swing space” (i.e., additional space) for other aviation squadrons. Hangar 6886, constructed in 2020, is a Type II hangar that houses an MV-22 squadron.

Based on the planning constraints described in Section 2.2.2, the proposed action is to base the MQ-9 in Hangar 102, base the KC-130J in existing Hangar 6886 (the current MV-22 hangar), and relocate the MV-22 squadron to a new Type II hangar in place of Hangar 103. Hangar 102 would house the MQ-9 aircraft, with minor interior renovations to the hangar and associated support facilities (see Section 2.1.1.3). Hangar 103 and the associated support buildings adjacent to its southwestern side (Buildings 159, 160, 161, 183, and 184) would be demolished and a new Type II hangar on a reinforced concrete pile foundation would be constructed in their place. The new hangar would include a maintenance bay, administrative office space, and an area with associated support equipment. Ancillary improvements associated with home basing the KC-130J squadron at Hangar 6886 include interior renovations, parking apron and taxiway modifications, parking for government and privately-owned vehicles, utilities and supporting infrastructure, and construction of training facilities at the hangar for operators and maintainers. Exterior features of the hangar structure would remain the same.

Table 2-1 Proposed Facilities Construction at MCB Hawaii Kaneohe Bay

<i>Project</i>	<i>Aircraft</i>	<i>Fiscal Year</i>	<i>Description</i>
Hangar 102 Renovations	MQ-9	2023–2024	<ul style="list-style-type: none"> Hangar 102 interior upgrades: electrical, mechanical, and communication systems Two GCSs with up to two ECUs
Infrastructure Improvements	MQ-9	2023–2024	Two GDTs (at Keawanui Hill and adjacent to Hangar 105)
Building 4041	MQ-9/ KC-130J	2023–2024	Training simulator installation
Apron Improvements	MQ-9	2023–2024	Tie-downs and striping near end of Runway 04/22 west of Hangar 105
Charlie Ramp Upgrades	KC-130J	2023–2024	Restriping of Charlie Ramp west of Hangar 6886 and east of Taxiway A
KC-130J Support Facilities	KC-130J	2023–2024	Construction of a wash rack east of Hangar 6886
Temporary Construction Staging Laydown Area	All	2023	Establish the temporary construction laydown area to stage construction equipment and materials at the Crescent Circle area behind MCAS terminal building
Airfield Security Fencing	All	2023–2024	<ul style="list-style-type: none"> Fencing on north side of Runway 04/22 Demolish Motor-T buildings/parking lot across from Hangar 101
Bravo Ramp Upgrades	MV-22	2025–2027	<ul style="list-style-type: none"> Repaving and restriping Bravo Ramp on bay side of Hangars 102, 103, and 104 Replacing taxiway asphalt Installing heat resistant concrete at parking spots Tie-downs at Bravo Ramp
Hangar 103 Replacement	MV-22	2025–2027	Demolition of Hangar 103 and associated support buildings adjacent to the southwestern side (Buildings 159, 160, 161, 183, and 184), and construction of new Type II Hangar 103 to accommodate MV-22s from Hangar 6886
Hangar 6886 Renovations	KC-130J	2026–2027	Reconfiguration of Hangar 6886 interior spaces to convert from MV-22 to KC-130J use
KC-130J Support Facilities	KC-130J	2026–2027	Construction of new support facilities east of Hangar 6886: <ul style="list-style-type: none"> Storage Facility Propeller Maintenance Facility
KC-130J Aircraft Direct Refueling System	KC-130J	2026–2027	Construction of a new refuel lane with an Aircraft Direct Refueling System: <ul style="list-style-type: none"> Demolition of Buildings 4000 and 5068 Construction of concrete pavement, asphalt shoulders, striping, fuel lines from the existing fuel farm, and a drainage system with storm water detention capability

Notes: Project locations are shown in Figure 2-6.

ECU = Environmental Control Unit; GCS = Ground Control Station; GDT = Ground Data Terminal; MCAS = Marine Corps Air Station.

Source: Marine Corps, 2021.

2.1.1.2 Ramps and Aprons

Bravo Ramp is an aircraft parking apron used for aircraft taxiing to and from Hangars 101–105. Concrete pavement, asphalt shoulders, an apron for MQ-9 aircraft, and striping would be installed on Bravo Ramp adjacent to Hangar 102 to accommodate the MQ-9 aircraft. The access road to facilities west of Taxiway F would be realigned, and minor site grading would be required to prepare subgrades for new pavement. Vehicular access to the parking area would be provided by new asphalt pavement connected to Pali Kilo Road. Tie-downs (see photo below) for MQ-9 aircraft would be constructed near the taxiway at the west end of the runway. Additional improvements include tie-downs placed at the western end of Bravo Ramp and the restriping of Charlie Ramp.



Photo: Example Tie-Down on Bravo Ramp

Portions of Bravo Ramp and Taxiway B would be repaved for the MV-22 and MQ-9 (approximately 10 acres). Portions of Charlie Ramp and Taxiway A would be restriped for the KC-130J (approximately 7 acres). KC-130J aircraft at Hangar 6886 would use Taxiway A to access the hangar, parking ramp, and runway.

2.1.1.3 Support Facilities

Support facilities for MQ-9 aircraft would include two ground control stations (GCSs), two ground data terminals (GDTs), and a ground support equipment (GSE) shed (see photos below). The GCSs and GSE shed would be located at Hangar 102. The GCSs are the “cockpit” of the MQ-9, providing command and control linkage between the UAV pilot and the aircraft. The two GDTs provide system and power redundancies to ensure positive control of the MQ-9 aircraft by the pilot. Each GDT would be installed on construction mats and would have a backup generator. One GDT would be installed on top of Keawanui Hill (requiring the removal of vegetation within a 30-by-30-foot area) and one near Hangar 105 on existing pavement. Power at Keawanui Hill would be supplied through the existing overhead electrical line. A fiber-optic communication cable would be installed along the existing overhead electrical poles. The GDTs would be tied down using stakes or 5,000-pound concrete blocks. While the GDT antennas would normally remain emplaced, they can be lowered when necessary, such as during high wind events.



Photo: Representative GCS Console



Photo: Representative GDT, Extended with Guy Wires

Support facilities for the KC-130J aircraft include a propeller maintenance facility, storage facility, a wash rack (see photo below), and an Aircraft Direct Refueling System (see photo below) that enables expeditious aircraft refueling. The propeller maintenance facility and storage facility would be built west of Building 1631, and the wash rack would be built west of Building 5069. The propeller maintenance facility provides the space, utilities, and equipment required to perform specialized propeller maintenance and repairs for the KC-130J aircraft. It also stores propellers, engines, fuselage tanks, mission gear, aviation refueling kits, and other equipment which require dehumidification and temperature control to prevent corrosion. The wash rack facility is a multi-level maintenance platform and support utility building to service the KC-130J aircraft. Each KC-130J is washed every 105 days, resulting in an average of one aircraft wash per week for corrosion prevention. Each wash typically uses 300–350 gallons of water. Wash water is captured, treated, and subsequently discharged into the sanitary sewer system. Construction of the Aircraft Direct Refueling System requires demolition of Buildings 4000 and 5068 and construction of concrete pavement, asphalt shoulders, striping, and fuel lines coming from the fuel farm. The proposed Aircraft Direct Refueling System would be accessed from the transient ramp. Low Impact Development (LID) techniques such as bioretention, vegetated swales, and vegetated filter strips would be installed to meet Clean Water Act (CWA) permit requirements for the management of storm water. In accordance with UFC 3-460-01, spill prevention and containment systems would be installed.



Photo: Representative KC-130J Wash Rack



Photo: Representative Aircraft Direct Fueling System

2.1.1.4 Utilities Infrastructure

Water, sewer, and electrical utilities would be improved within the construction footprint. Upgraded drainage systems including a new storm water detention basin would be constructed to manage any increase in storm water runoff.

2.1.2 Personnel

The proposed action would station approximately 229 MQ-9 and 447 KC-130J military personnel, for a total of approximately 676 personnel plus dependents at MCB Hawaii Kaneohe Bay. The deactivation of the existing AH-1/UH-1 and CH-53E helicopter squadrons and divestment of RQ-21 aircraft at MCB Hawaii Kaneohe Bay, to be complete in 2022, results in a reduction of 841 personnel plus dependents from MCB Hawaii Kaneohe Bay. The deactivation and divestment actions combined with the proposed action are anticipated to result in a net reduction of approximately 165 personnel (and their dependents) at the base.

2.1.3 Operations

Elements from both the MQ-9 and KC-130J squadrons would initially operate using existing and temporary facilities and equipment until full construction is complete in 2027. Squadron personnel and operational tempo would increase gradually throughout the construction period, but full operational tempo would not occur until construction is complete and full support services are available for personnel and aircraft.

Table 2-2 is a summary of existing and proposed aircraft loading. It is anticipated that two MQ-9 aircraft would be based at MCB Hawaii Kaneohe Bay in 2023. It is anticipated that an additional four MQ-9 aircraft would arrive in Fiscal Year (FY) 2024. It is anticipated that 6 KC-130J aircraft would be based at MCB Hawaii Kaneohe Bay in 2023, increasing to an anticipated total of 15 aircraft in FY 2025. The number of KC-130J and MQ-9 aircraft and associated personnel at the installation at any one time would vary throughout the year depending on operational cycles and required detachment support.

Table 2-2 Proposed Aircraft Loading at MCB Hawaii Kaneohe Bay

	<i>Existing</i>	<i>Change</i>	<i>Total</i>
MV-22	26	0	26
C-20	2	0	2
MH-60	15	0	15
P-8A	2	0	2
C-40	2	0	2
MQ-9	0	6	6
KC-130J	0	15	15
Total	47	21	68

Table 2-3 is a summary of existing and proposed aircraft operations at MCB Hawaii Kaneohe Bay. An aircraft operation is defined as a single event such as a takeoff or landing. Thus, for example, a “touch” (landing) and “go” (takeoff) exercise is counted as two aircraft operations. Changes in aircraft operations at the airfield include an increase of approximately 3,000 annual MQ-9 aircraft operations and approximately 5,280 KC-130J annual operations. The existing use of the airfield by other tenant Marine Corps and Navy squadrons and by non-tenant (transient) aircraft squadrons would not change. While the proposed operations are an increase from existing conditions (28,758 to 37,038), they are less than the 41,512 total annual aircraft operations that were occurring just prior to the 2022 deactivation of the two helicopter squadrons and RQ-21 divestment. Thus, aircraft operations following implementation of the proposed action would be approximately 11 percent less than what was occurring at MCB Hawaii Kaneohe Bay before May 2022.

2.2 Alternatives Development

NEPA’s implementing regulations require agencies to consider reasonable alternatives, defined as alternatives to a proposed action that would avoid or minimize adverse impacts and are practical and feasible and meet the purpose and need of the proposed action.

Table 2-3 Proposed Aircraft Operations at MCB Hawaii Kaneohe Bay

	<i>Existing</i>	<i>Change</i>	<i>Total</i>
Existing (Based)			
MV-22	14,234	0	14,234
MH-60	7,360	0	7,360
P-8A	284	0	284
C-40	266	0	266
<i>Subtotal</i>	<i>22,144</i>	<i>0</i>	<i>22,144</i>
Existing (Transient)			
Fighters	750	0	750
Heavy Jet	4,052	0	4,052
Helicopters	1,066	0	1,066
Other Light	746	0	746
<i>Subtotal</i>	<i>6,614</i>	<i>0</i>	<i>6,614</i>
Proposed			
MQ-9	0	3,000	3,000
KC-130J	0	5,280	5,280
<i>Subtotal</i>	<i>0</i>	<i>8,280</i>	<i>8,280</i>
Total	28,758	8,280	37,038

2.2.1 Alternatives Screening Analysis

Screening criteria for each squadron were developed based on their minimum infrastructure and operating requirements to determine if other Hawaii military-controlled airfields could meet the purpose and need of the proposed action.

The four screening criteria for home basing the MQ-9 and KC-130J squadrons are:

1. Military-Controlled and Secured Facilities. The project location must be at an airfield that affords access to separate military-controlled and secured facilities. Aircraft operations for MQ-9 and KC-130J aircraft can occur at a non-military-controlled airfield, but home basing of the military aircraft with its associated maintenance, command and control, and security protocols requires a military-controlled and secured area.
2. Minimum Airfield Infrastructure. The military-controlled airfield must meet minimum airfield infrastructure requirements (or have the space to construct such infrastructure), including dedicated hangars for both aircraft types. The runway must meet minimum airfield characteristics to include length, width, and runway surface, including minimum weight bearing requirements. The MQ-9 requires a runway 7,500 feet long and at least 75 feet wide, with taxiways a minimum width of 50 feet. The KC-130J requires a Class B runway 200 feet wide and 6,000 feet long with a weight bearing capacity of 175,000 pounds single tandem (i.e., a wheel configuration with single wheel one in front of the other). Vertical obstructions for both aircraft must be in accordance with DoD airfield safety clearances. The minimum hangar requirement for the KC-130J is a Type II hangar, and the MQ-9 requires a Type IV hangar. Each aircraft squadron requires its own dedicated hangar.
3. Access to Training Areas and Airspace. The military-controlled airfield must have access to established operating and training areas and airspace capable of supporting MQ-9 and KC-130J

operations. This includes airspace where KC-130J aircraft can conduct aerial refueling operations.

4. Sustainment and Support. The military-controlled airfield must be capable of supporting long-term sustainment and maintenance for continued operations of MQ-9 and KC-130J aircraft. This includes availability and access to secure communications networks. Support services include fuel services, maintenance, supply, and avionics support equipment. The MQ-9 and KC-130J squadrons require access to Secure Internet Protocol Router Networks and associated storage facilities and workspaces.

Five Hawaii military airfields were evaluated against the four criteria. The locations included MCB Hawaii Kaneohe Bay, Joint Base Pearl Harbor-Hickam (JBPHH), U.S. Coast Guard (USCG) Air Station Barbers Point, Wheeler Army Airfield, and Dillingham Military Reservation (Figure 2-2). Application of the screening criteria to these five bases is described below.

2.2.1.1 MCB Hawaii Kaneohe Bay

MCB Hawaii Kaneohe Bay satisfies all criteria. It is a military-controlled airfield with a 7,800-foot runway that meets length and weight-bearing airfield requirements for both aircraft types. MCB Hawaii Kaneohe Bay has an existing hangar that can be configured for the MQ-9 (Hangar 102). For KC-130J aircraft, the base could accommodate the aircraft in the existing MV-22 hangar, 6886, and relocate the MV-22 squadron to a Hangar 103 replacement hangar. The operations of the proposed two new squadrons are compatible with existing base operations. The base also has existing services capable of supporting interim phase MQ-9 and KC-130J requirements and has the capacity to accommodate additional required services. In addition, MCB Hawaii Kaneohe Bay has secure communications network/facility access and Secure Internet Protocol Router Networks and associated storage facilities and workspaces available to the to the two squadrons.

2.2.1.2 JBPHH

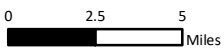
JBPHH is a military-controlled airfield, but it does not meet Criteria 2, 3, or 4. It has a 12,300-foot runway that meets length and weight-bearing airfield requirements for the MQ-9 and KC-130J; however, it does not satisfy Criterion 2 because all its hangars are fully committed to Air Force uses (JBPHH, 2021). In addition, the base is fully developed with no undeveloped space available to construct the necessary home basing infrastructure. It does not satisfy Criterion 3 because Federal Aviation Administration (FAA) restrictions forbid unmanned aircraft operations of any type in the vicinity of the Honolulu International Airport. The DoD cannot operate Group 5 unmanned aircraft like the MQ-9 out of JBPHH. It has aircraft support services similar to those required for supporting MQ-9 and KC-130J aircraft; however, it does not satisfy Criterion 4 because JBPHH cannot provide support services for two new squadron operations without adversely affecting existing base operations (JBPHH, 2021).

Document Path: G:\Project - 023019 MCBH Homebased EA\02-Maps\Figures with Titles\Figure 2-3. Alternatives Screening on Oahu.mxd

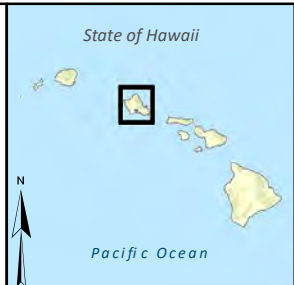


Figure 2-2. Alternatives Screening on Oahu

- ★ Candidate Military Airfield Locations
 - Interstate
 - State Highway
 - County and Local Highway
- Land Use**
- Forest
 - Waterbody



Sources: DoD, 2019; Esri, 2021; Hawaii Statewide GIS, 2021



2.2.1.3 USCG Air Station Barbers Point

USCG Air Station Barbers Point is a military-controlled portion of the Kalaeloa airfield, but it does not meet Criteria 2, 3, or 4. It has an 8,000-foot state-controlled runway operated under a joint use agreement with Hawaii Department of Transportation (HDOT). The runway meets length and weight-bearing airfield requirements; however, it does not satisfy Criterion 2 because it does not have adequate hangars even for its existing HC-130J aircraft, nor the space to construct new hangars. The amount of space required to construct new hangars and supporting infrastructure for two new squadrons is approximately 32 acres. The DoD coordinated with HDOT to discuss the availability of suitable land for the proposed action. While the current operating agreement shows 106 acres of Navy property adjacent to the airfield (Naval Facilities Engineering Systems Command [NAVFAC], 2021), only a small disaggregated portion of that acreage is possibly developable. This collection of disparate parcels is insufficient to accommodate the minimum footprint for the hangar, apron, and supporting facilities. USCG Air Station Barbers Point does not satisfy Criterion 3 for the same reason as JBPHH — FAA restrictions forbidding unmanned aircraft operations of any type in the vicinity of the Honolulu International Airport. USCG Air Station Barbers Point does not satisfy Criterion 4 because the limited undeveloped acreage is insufficient for the additional infrastructure required to home base two new squadrons, and the base secure communications network is not compatible with the Naval Force Secure Requirement.

2.2.1.4 Wheeler Army Airfield

Wheeler Army Airfield satisfies Criteria 1 and 3: it is a military-controlled airfield, and operations of the proposed two squadrons are compatible with existing base operations. However, it does not satisfy Criterion 2 because its 5,600-foot runway cannot be extended within the DoD property due to public roadways and non-DoD land on either end of the runway. In addition, Wheeler Army Airfield lacks existing hangar space for MQ-9 and KC-130J aircraft; has an insufficient amount of undeveloped land to accommodate the minimum footprint for the hangar, apron, and supporting facilities; and the airfield is fully developed and committed to other aircraft operations. Wheeler Army Airfield does not satisfy Criterion 4 because, like USCG Barbers Point, the secure communications network is not compatible with the Naval Force Secure Requirement.

2.2.1.5 Dillingham Military Reservation

Dillingham Military Reservation satisfies Criterion 3 as it has access to training areas and airspace, but it does not meet Criteria 1, 2, or 4. Dillingham Military Reservation does not satisfy Criterion 1 because it is not a military-controlled airfield. The U.S. Army currently leases the property to HDOT, which manages the airfield for predominantly general aviation purposes. The lease does not allow for construction and operation of the necessary home basing infrastructure, and HDOT has given no indication of support to modifying its lease. With regards to Criterion 2, the base has a 5,000-foot runway within a 9,007-foot paved area; however, the runway does not meet requisite weight bearing requirements for a single-tandem aircraft at 175,000 pounds and is in fact closed to aircraft heavier than 12,500 pounds. The entire runway would need to be demolished and reconstructed to accommodate the additional weight of KC-130J aircraft. The airfield is fully developed and committed for general aviation operations and lacks enough undeveloped acreage for construction of the infrastructure required to home base two new squadrons. In addition to the lack of developable acreage, Dillingham Military Reservation does not satisfy Criterion 4 because it does not have a secure communications network or facility access, and its use as a civilian airfield makes it unable to acquire such capabilities. Finally, its general aviation and

recreational aviation services and corresponding airfield capabilities are inconsistent with and could not accommodate requisite home basing support services such as an Aircraft Direct Refueling System.

Only MCB Hawaii Kaneohe Bay satisfies all the minimum installation and operating criteria required to meet the proposed action purpose and need (Table 2-4). Therefore, no other locations are carried forward for analysis in this EA.

Table 2-4 Alternatives Screening Analysis Summary

<i>Screening Criteria¹</i>	<i>1) Military-Controlled and Secured Facilities</i>	<i>2) Minimum Airfield Infrastructure</i>	<i>3) Access to Training Areas and Airspace</i>	<i>4) Sustainment and Support</i>
MCB Hawaii Kaneohe Bay	Yes	Yes	Yes	Yes
JBPHH	Yes	No	No	No
USCG Air Station Barbers Point	Yes	No	No	No
Wheeler Army Airfield	Yes	No	Yes	No
Dillingham Military Reservation	No	No	Yes	No

Notes: ¹Alternatives screening analysis details are in the text of Section 2.2.1.

JBPHH = Joint Base Pearl Harbor-Hickam; MCB = Marine Corps Base; USCG = United States Coast Guard.

2.2.2 Alternate Siting Locations at MCB Hawaii Kaneohe Bay

In 2021, the Marine Corps analyzed MCB Hawaii Kaneohe Bay’s capability for growth. This planning process considered currently developed areas along the flightline as well as the partially developed areas (see Figure 1-2) of West Field, north of the western end of the runway; Green Field, east of the Transient Ramp on the southern side of the runway; and Pali Kilo across from Green Field on the north side of the runway. Development of MCB Hawaii Kaneohe Bay flightline layout options for the proposed action were governed by the planning requirements summarized below:

- Airfield Safety Clearances. The runway requires a 750-foot lateral clearance from the runway centerline on each side, and then a transitional surface sloping upward with a ratio of seven horizontal units for each unit of vertical rise, rising perpendicularly away from the runway (see image below). This restricts the height of facilities near the runway. Figure 2-3 shows airfield safety clearances established for fixed wing and helicopter air stations in UFC 3-260-01.
- Explosive Safety Quantity Distance (ESQD). ESQD requirements are applicable to ammunition and explosives and other hazardous material at DoD activities. Hangars cannot be within an ESQD arc.
- Compass Calibration Pad Magnetic Quiet Zone. An aircraft magnetic compass is checked on a frequent, routine schedule at a compass calibration pad. The center of the pad must be at least 500 feet from magnetic objects such as large parking lots, buildings, busy roads, railroad tracks, high-voltage electrical transmission lines or cables carrying direct current (either above or below ground) to prevent interference with the calibration of the compass.

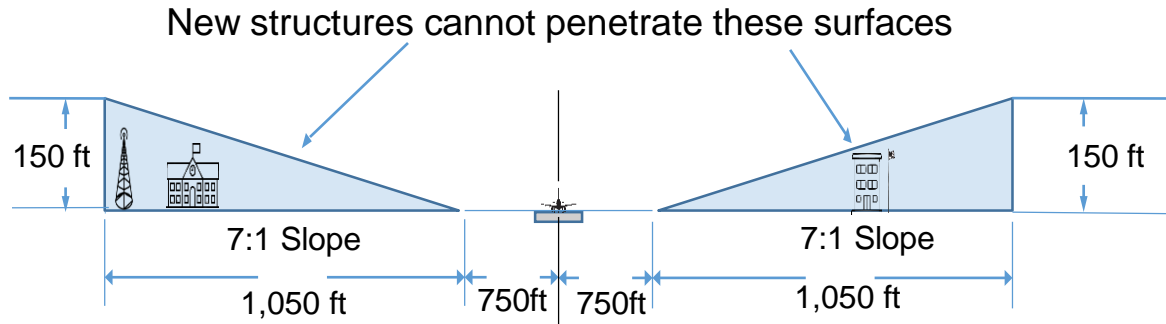


Figure 2-3 Airfield Safety Clearances

In applying these requirements, the resulting flightline layout coordinates functional and locational relationships among the runway, taxiways, aircraft parking areas, and flightline support facilities such as hangars, wash racks, air traffic control, and mission support.

Figure 2-4 shows planning constraints at the airfield and Figure 2-5 shows planning constraints specific to Green Field. With interior renovations, Hangar 102 can accommodate the smaller MQ-9 airframe. During the siting process, in addition to the location and configuration described in Alternative 1, the Marine Corps considered three alternative locations for the KC-130J hangar: West Field, Green Field, and Pali Kilo.

- West Field. Development at West Field for KC-130J facilities is constrained by ESQD arcs associated with the Combat Aircraft Loading Apron and the Ordnance Assembly Area (see Figure 2-4), the magnetic quiet zone around the compass calibration pad, taxiway obstacle-free areas, and flood hazards. In addition, West Field’s proximity to the runway and other airfield surfaces results in an inability to place a suitably sized hangar and apron at this site (see Figure 2-4). Relocating the Combat Aircraft Loading Apron and Ordnance Assembly Area is not feasible because there are no available open spaces on the installation that would allow siting of the ESQD arc without impacting current operations and facilities. Relocation of the magnetic quiet zone and ensuring that taxiway obstacle-free areas remain as such pose similar challenges. Finally, placing a hangar and apron at this location would increase the amount of vehicle traffic needing to access the north side of the runway. Transportation to the north side of West Field is currently constrained because there is no perimeter road, requiring all vehicles and personnel to use the Mokapu Road crossing over the active runway, which is frequently closed due to aircraft operations. To accommodate the proposed action’s increased mission traffic while ensuring operational availability of the runway, any hangar development north of the Mokapu Road crossing would require construction of an underground tunnel beneath the runway at the current Mokapu Road crossing. This is infeasible because construction of such a tunnel would require frequent and extended closure of the runway, unacceptably impacting the base’s mission; the high-water table in the area; the high potential to impact subsurface archaeological resources; and would be unreasonably expensive at an estimated cost of more than \$200 million. For these reasons, West Field site is not a reasonable alternative for location of a new KC-130J hangar.

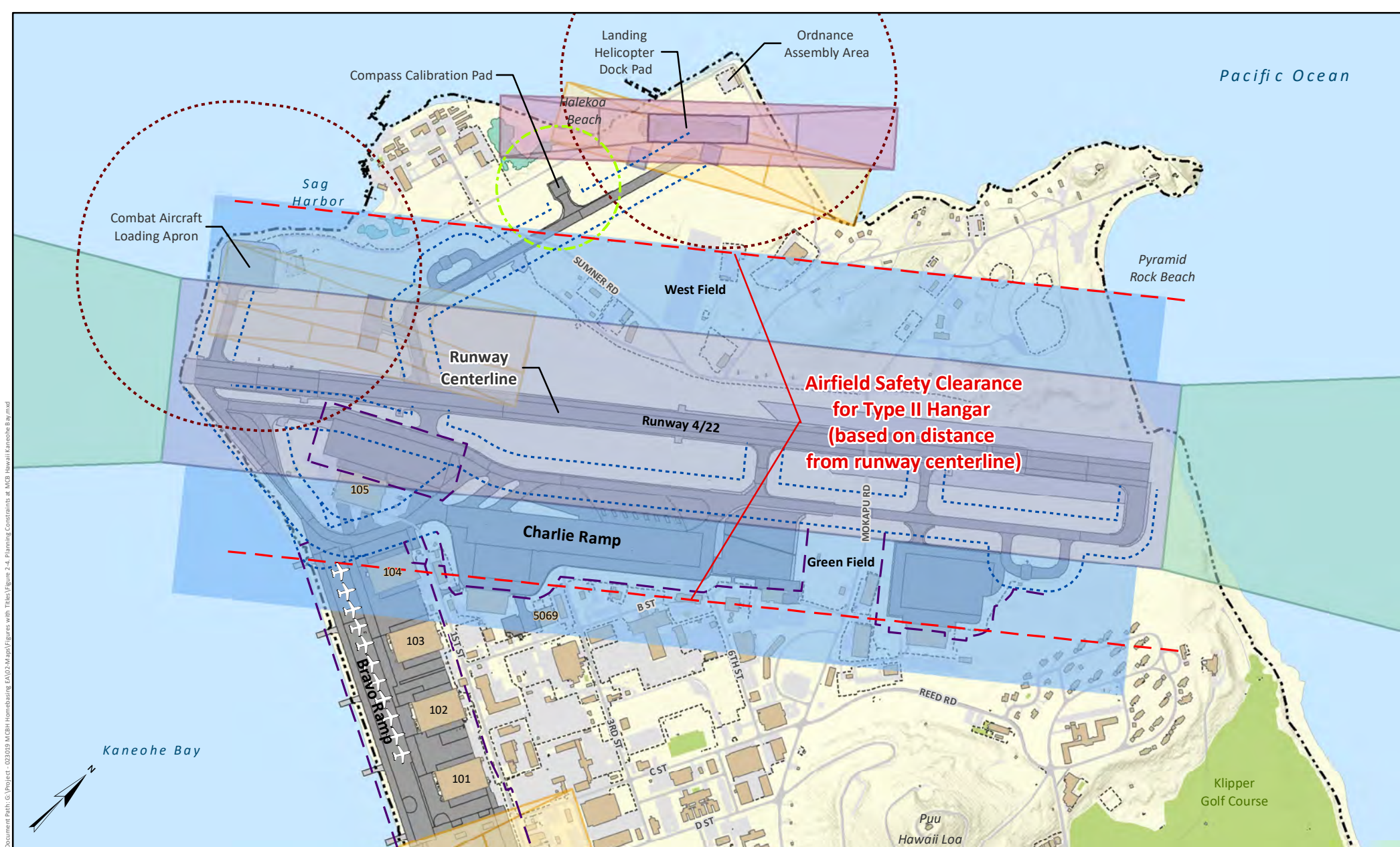


Figure 2-4. Planning Constraints at MCB Hawaii Kaneohe Bay

MCB Hawaii Kaneohe Bay Boundary	Installation Road	Notional Airplane	<u>Imaginary Surface</u>
Installation Fence	Parking Area	Airfield Safety Clearance for Type II Hangar	Clear Zone III
Airfield Pavement/Apron	Recreation Area	Apron Obstacle Free Area	Primary Surface
Airfield Road	Wetland	ESQD Arc	Helipad Imaginary Surface
Building		Quiet Zone	LHD Imaginary Surface
		Taxiway Obstacle Free Area	

0 1,000 2,000 Feet

Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

Project Area

Oahu

Pacific Ocean

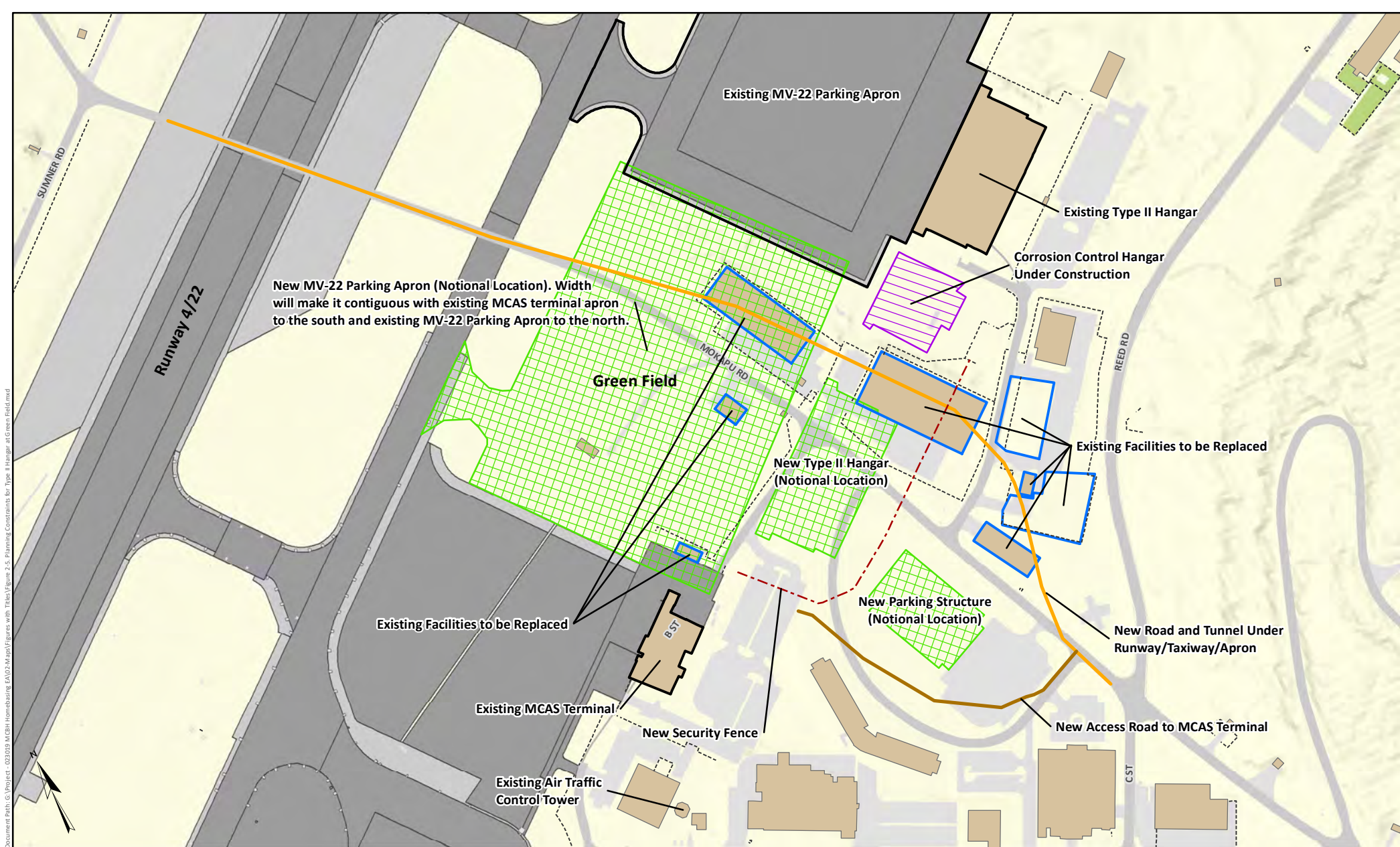
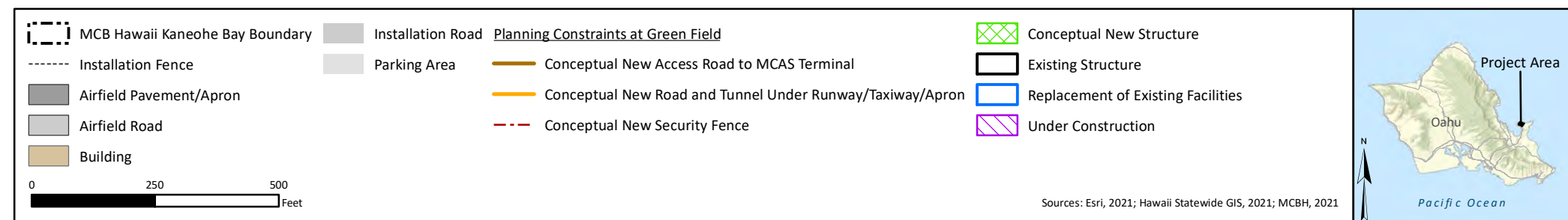


Figure 2-5. Planning Constraints for Type II Hangar at Green Field



- Green Field site (see Figure 2-5). This is an 8-acre partially undeveloped area located between the transient ramp and Mokapu Road. It consists of storage sheds, meteorological equipment, and open space. The Visiting Aircraft Line is immediately adjacent to the Green Field site. Development of a new hangar on this site is unreasonable for several reasons. Construction of a hangar at this location would adversely impact the line-of-sight for the Air Traffic Control tower by blocking Air Traffic Control's view of aircraft movements on the ground and in the air. The site does not allow for sufficient airfield safety clearance between Taxiway A, the air terminal, and Mokapu Road for the aircraft parking apron, taxiways, and associated pavement. The setback from the runway centerline would place the hangar further east than the Air Terminal due to the hangar height. Mokapu Road and existing major utilities (electrical, potable water, sewer, and communications) would need to be relocated, including the Mokapu Road relocation required for access to West Field. The Air Terminal mechanical plant, storage facilities, parking, photovoltaic systems, access road to the Terminal, and two warehouse facilities near Mokapu Road would need to be demolished and replaced. The complex used to store and process Hazardous Material/Waste (Buildings 6407, 6408, 6409, 6474, and 6685) would need to be relocated and replaced. There is an ESQD arc near the Air Terminal building associated with storage of small ordnance and survival equipment that provide support for the units that transition through the facility and a new site would need to be identified for this mission. Large commercial and military aircraft park proximate to Green Field, creating conflicts associated with jet blast, wingtip clearance, and personnel and equipment movement. Finally, relocation of the displaced facilities would delay hangar construction for the proposed action by 10–12 years. For these reasons, this site is not a reasonable alternative for location of a new KC-130J hangar.
- Pali Kilo. This location would also be located on the north side of the runway and would require construction of an underground tunnel. In addition, Pali Kilo is within the airfield safety zone of the helicopter landing pads (see Figure 2-4). The required setback from the runway centerline would place the hangar and parking aprons within the tsunami evacuation zone. Finally, this site would require excavation into Keawanui Hill resulting in extensive amounts of cut and fill in an area known to have subsurface archaeological sites. Therefore, this site is not a reasonable alternative for location of a new KC-130J hangar.

Construction of a KC-130J Type II hangar and associated apron at West Field, Green Field, or Pali Kilo sites is not feasible. Nor is it possible to locate the KC 130J squadron along Bravo Ramp in a new replacement hangar as the KC-130J wingspan is too wide to use Bravo Ramp when aircraft are parked there, and the ramp cannot be expanded due to its location adjacent to Kaneohe Bay. Bravo Ramp is both an active taxiway and a parking apron. The only viable alternative is to locate the KC-130J in Hangar 6886, utilize the Charlie Ramp for KC-130J parking, and relocate the MV-22 squadron to a replacement Type II hangar on Hangar Row. This is possible because, unlike the KC 130J, the MV-22 requires less taxiway width and can use Bravo Ramp to taxi to the runway. Therefore, the only feasible alternative to support KC-130J hangar requirements that also accommodates existing airfield operations is to construct a new Type II hangar on Bravo Ramp, move the MV-22 squadron to that location, and modify the interior of Hangar 6886 to accommodate the KC-130J.

The absence of space for a new additional hangar along Bravo Ramp necessitates the demolition of an existing hangar. Hangar 103 is the only available hangar location that can accommodate a new Type II-sized hangar. Hangar 101 is committed to other aircraft squadrons. Hangar 102 is currently used for UAV operations and is the proposed location for the new MQ-9 squadron. Relocating the MV-22 to Hangars

104 or 105 is infeasible because construction of a new Type II hangar at either site would violate airfield primary surfaces (see Figure 2-4). Also, it is not possible to site a larger Type II facility at the Hangar 104 site and still provide enough space for the required aircraft parking apron.

2.2.3 Alternative 1

As described above, Alternative 1 is the only reasonable action alternative that can accommodate the two new squadrons on MCB Hawaii Kaneohe Bay. Figure 2-6 shows the proposed configuration of facilities under this alternative. The details of each component are presented in Section 2.1, *Proposed Action*.

2.2.4 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. The Marine Corps would not base the MQ-9 and KC-130J squadrons in Hawaii with its attendant personnel, and would not undertake the infrastructure upgrades necessary to accommodate the squadrons. Current permanently based platforms would remain, including the MV-22 Osprey, C-20G, P-8A Poseidon, C-40, and MH-60.

The No-Action Alternative does not meet the purpose of and need for the proposed action because it would not enable the Hawaii-based Marine Corps to enhance aerial refueling, transport and intelligence, surveillance, and reconnaissance capabilities to support USINDOPACOM. The No-Action Alternative is included here as the baseline for assessing the impacts of the proposed action.

2.3 Conservation Measures

Conservation measures are existing policies, practices, and measures that the Marine Corps would adopt to reduce the environmental impacts of designated activities, functions, and processes. Conservation measures mitigate potential impacts by avoiding, minimizing, or eliminating impacts. They are distinguished from potential mitigation measures because conservation measures are either specific requirements applicable to the proposed action or established regularly occurring practices routinely implemented for Marine Corps projects. In other words, the conservation measures identified in this document are inherently part of the proposed action and are not mitigation measures specifically identified as part of this NEPA environmental review process. Table 2-5 lists conservation measures that would be implemented as part of the proposed action. Mitigation measures are discussed separately in Chapter 3.



Figure 2-6. Alternative 1

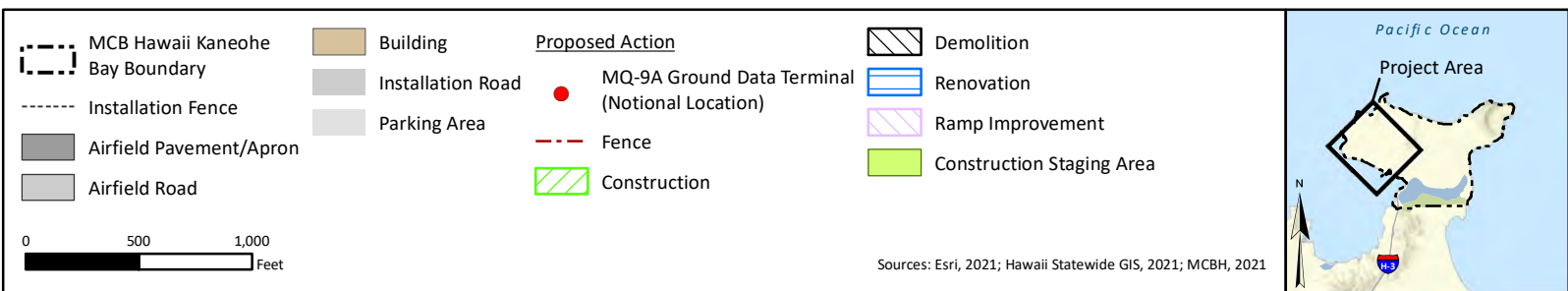


Table 2-5 Proposed Conservation Measures

<i>Conservation Measure</i>	<i>Impacts Reduced/Avoided</i>	<i>Description</i>	<i>Applicability</i>
Storm Water Management	Minimize pollutants in storm water flows	<p>Conservation measures used near or on the runways are filter socks around and filter fabric inside the storm drains to prevent pollutants from getting into the MS4. Any sediment stockpile on the ramps would require filter socks and be frequently watered down using a water truck for dust control. Plastic tarps are not used in the vicinity of active aircraft operations.</p> <p>At contractor trailer/staging areas, conservation measures to consider stabilized construction entrance and exits, boundary fencing with fabric, filter socks around perimeter, and/or silt fence.</p>	Construction
Storm Water LID Techniques	Minimize pollutants in storm water flows	LID techniques such as bioretention, vegetated swales, and/or vegetated filter strips would be used during construction. Features such as underground chambers and pervious pavement should be considered as LID for water management beyond the construction period.	Construction
Storm Water Permit Requirements	Minimize pollutants in storm water flows	Requirements of the NPDES permit required for the discharge of storm water associated with construction activity, including a SWPPP.	Construction
Storm Water Detention Basin	Minimize attraction of birds	The detention basin would be covered in a manner to avoid attracting birds.	Construction
Windows	Minimize attraction of birds	Windows facing or adjacent to the flightline that have the potential to attract birds to the flightline would have design features to minimize their attraction, including tinted glass or film with a visible light transmittance value of 30% or less (inside to outside).	Construction
Hangar Doors	Minimize attraction of birds	Aircraft hangars should not use translucent doors or have windows. The hangar doors should be solid and not allow any interior light to pass through. If a hangar door has a window requirement, tinting is recommended.	Construction
Hangar Doors	Minimize attraction of birds	Unless nighttime operations are in progress, doors should be shut at night to prevent light emitting outward. This could include partially closing doors and turning off lighting when operations not occurring, as well as incorporation of an easy-to-use light switching system. Doors should allow user to open and close with ease to ensure that hangar doors can be shut at night to prevent light emitting outward.	Operation

Table 2-5 Proposed Conservation Measures

<i>Conservation Measure</i>	<i>Impacts Reduced/Avoided</i>	<i>Description</i>	<i>Applicability</i>
Lighting	Bird/bat disorientation/fallout	<p>Exterior lighting would follow MCB Hawaii standards (MCB Hawaii, 2022a). When exterior lighting is required, all exterior lights for new construction, replacement of existing fixtures, and renovations would meet or exceed USFWS, NOAA, and/or IDA standards unless otherwise required by the military mission, per the MCB Hawaii INRMP (MCB Hawaii, 2017, pg. C2-15).</p> <p>New and renovated buildings along the flightline should follow lighting requirements to the maximum extent feasible to prevent seabirds from being attracted to areas with aircraft operations. These include:</p> <ul style="list-style-type: none"> • Shielded exterior lighting (points downward) and full cutoff. • Controlled; only be “On” when needed and have ability to shut off lighting when not in use. • Timers and motion-activated lighting to minimize unnecessary light remaining on throughout the night. • Minimize light trespass. Only light the required area – to conserve energy and to prevent unwanted light from trespassing into regions where it is not needed. • Minimize brightness. Be no brighter than necessary. • Minimize blue light emissions. • Use full cutoff downward/shielded bollards in parking areas and sidewalks, and full cutoff downward/shielded wall packs for walkways and entrances/exits. • Light fixtures as low as possible to the ground. • All nighttime construction work and construction lighting would be pre-approved with Environmental Compliance & Protection Division Natural Resources. • Use warm light sources for exterior lighting. 	Construction/Operation
Lighting	Minimize attraction of birds	Limit use of lights during the seabird fledging period.	Operation
Windows	Minimize attraction of birds	For windows facing or adjacent to flightline that have the potential to attract birds to the flightline: tinted glass or film with a visible light transmittance value of 30% percent or less (inside to outside) used on all glass windows, doors, and walls within line of sight of the flightline.	Operation

Table 2-5 Proposed Conservation Measures

<i>Conservation Measure</i>	<i>Impacts Reduced/Avoided</i>	<i>Description</i>	<i>Applicability</i>
Tree Trimming/Removal	Minimize impacts to Hawaiian hoary bat (pupping season)	Tree trimming/removal activities would be conducted outside of the bat pupping season of 1 June to 15 September.	Construction
Hangars	Minimize bird nesting	Interior portions of the hangars would be designed with netting or slanted surfaces to keep birds from nesting in the hangar.	Construction/Operations
Fencing	Minimize hoary bat entanglement	The proposed fencing would not consist of barbed wire fencing that could entangle foraging Hawaiian hoary bats.	Construction
Education	Minimize indirect effects to ESA-listed species from contractors, personnel, and dependents	All construction contractors and aircraft squadron personnel would participate in MCB Hawaii Kaneohe Bay’s existing natural resources education program. The program would include, at a minimum, the following topics: (1) occurrence of natural resources (including ESA-listed species); (2) sensitivity of the natural resources to human activities; (3) legal protection for certain natural resources; (4) penalties for violations of federal law; (5) general ecology and wildlife activity patterns; (6) reporting requirements; (7) measures to protect natural resources; (8) personal measures that users can take to promote the conservation of natural resources; and (9) procedures and a point of contact for ESA-listed species observations.	Construction/Operations

Notes: % = percent; ESA = Endangered Species Act; IDA = International Dark-Sky Association; INRMP = Integrated Natural Resources Management Plan; LID = Low Impact Development; MCB = Marine Corps Base; MS4 = Municipal Separate Storm Sewer System; NOAA = National Oceanic and Atmospheric Administration; NPDES = National Pollutant Discharge Elimination System; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service.

3 Affected Environment and Environmental Consequences

This chapter presents a description of the existing environment and an analysis of the potential direct and indirect effects of Alternative 1 (cumulative effects are presented in Chapter 4). The level of detail used in describing an environmental consequence is commensurate with the anticipated level of potential environmental impact. Each section in this chapter defines a region of influence for each resource.

“Significantly,’ as used in NEPA, requires considerations of both the degree of effects and the affected environment, such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant” (40 CFR Part 1501.3(b)). An impact would be significant or less than significant.

Environmental impacts analyzed in detail in this EA are noise, air quality, water resources, cultural resources, biological resources, public health and safety, and transportation.

Potential impacts to the following resource areas are negligible or nonexistent and, therefore, are not analyzed in detail in this EA:

Socioeconomics: Socioeconomics looks at the effects of the proposed action outside the base on the population; employment/industry characteristics; demand for schools, housing, recreational facilities; and demographic, economic, and fiscal impact on Kaneohe, Kailua, and the County of Honolulu. The entire proposed action, to include construction and operation, is located exclusively on MCB Hawaii Kaneohe Bay and in established military training areas. Under the proposed action, personnel levels would be at or below the levels supported by MCB Kaneohe Bay and the surrounding community over the last decade. Due to the recent deactivation of several units aboard MCB Kaneohe Bay, on-base housing and school capacity would be sufficient to accommodate the new personnel. It is anticipated that the ratio of on-base to off-base housing remains consistent. As such, given the overall reduction in personnel, the proposed action would result in negligible changes, if any, to populations outside the base, with similarly negligible corresponding impacts to employment or industry characteristics; demand for schools, housing, and recreational facilities; and changes to the demographic, economic, or fiscal conditions of Kailua, Kaneohe, or County of Honolulu. The construction may provide some minor, temporary beneficial impacts to the local economy from construction-related jobs and purchasing, but no long-term increase in employment would result from the addition of the two new squadrons. Given there would be negligible to potential minor positive impacts to socioeconomic factors, further analysis is not required.

Environmental Justice: The proposed action would have no disproportionate impacts to minority or low-income populations. The proposed action would primarily occur on MCB Kaneohe Bay, with off-base impacts limited to approach and departure of aircraft as well as potential for community impact from individuals seeking off-base housing. With regards to aircraft operations, the new squadrons would train within the same airspace and ranges as existing aircraft based at MCB Hawaii Kaneohe Bay. Following the 2022 deactivation of the two helicopter squadrons, the two new squadrons represent an increase of aircraft operations above existing conditions. Although the proposed action would introduce a minor increase in aircraft operations and average noise levels, the net change would be a decrease in noise when considered with historic fluctuations of aircraft operations at the installation in years prior to the deactivations in 2022. No training operations are conducted over populated areas. In addition, all

construction and all non-aerial operations such as aircraft maintenance would take place entirely on MCB Hawaii Kaneohe Bay in previously disturbed areas. Finally, as described further in Chapter 3, the analysis indicates the proposed action would result in less than significant impact on the physical or natural environment. As noted in socioeconomics, the ratio of on-base to off-base housing is anticipated to remain constant. Considering any changes to the airfield noise environment would be minimal (see Section 3.1, Noise), and the proposed action's area of effect and less than significant effects on socioeconomics and environmental resources, there would be no disproportionate adverse impacts on any minority or low-income population. As such, Environmental Justice is not evaluated further in this EA.

Geologic Resources: The proposed action would require construction of an updated hangar and ancillary support buildings, improvements to aircraft parking apron, and utility upgrades. Except for 4.25 landscaped acres, all construction would be in areas that are developed or have been previously disturbed. As such, beyond disturbance of surface soils during construction, there would be no impact to geological resources and thus this resource is not evaluated further in this EA.

3.1 Noise

Noise is unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Noise may be intermittent or continuous, steady or impulsive. It may also be stationary or transient. Stationary sources are normally related to specific land uses, e.g., an amusement park or industrial plant. Transient noise sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flight tracks around airports), or randomly. Responses to noise vary according to the type of noise and the characteristics of the sound source, the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal).

The physical characteristics of noise and/or sound include its intensity, frequency, and duration. The unit used to measure the intensity of sound is the decibel (dB). Sound intensity varies widely (from a soft whisper to a jet engine) and is measured on a logarithmic scale to accommodate this wide range. Human hearing ranges up to 120 dB, at which point sound causes physical discomfort.

The frequency of sound is measured in cycles per second, or Hz. Low frequency sounds are heard as rumbles or roars, and high frequency sounds are heard as screeches. Sound measurement is further refined by “weighting.” The human ear is most sensitive to frequencies in the 1,000 to 4,000 Hz range. Sound meters calibrated to emphasize frequencies in this range are termed “A-weighted,” and sound is identified in terms of A-weighted decibels (dBA). Unless otherwise stated in the EA, dB units refer to dBA-weighted sound levels.

The duration of a noise event and the number of times it occurs are also important considerations in assessing noise impacts. For example, at about 3 feet, noise from normal human speech ranges from 63 to 65 dBA, operating kitchen appliances range from about 83 to 88 dBA, and rock bands approach 110 dBA.

The primary metric supporting the assessment of noise from aircraft operations within this EA is the Day-Night Average Sound Level (DNL). The DNL is an A-weighted cumulative noise metric that measures noise based on an annual average of daily aircraft operations. Since DNL is the U.S. Government standard for modeling the cumulative noise exposure and assessing community noise impacts, the airfield noise exposure in this EA is reported in DNL. The DNL has two time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. The DNL weights operations occurring during its nighttime period by adding 10 dB to their single event sound level. Note that “daytime” and “nighttime” in calculating DNL are sometimes referred to as “acoustical day” and “acoustical night” and always correspond to the times given above. This is often different from the “day” and “night” used commonly in military aviation, which are directly related to the times of sunrise and sunset and vary throughout the year with the seasonal changes.

3.1.1 Affected Environment

The predominant noise sources in the project area and region of influence are the aircraft using MCB Hawaii Kaneohe Bay airfield. This includes aircraft flying to and from the runway, taxiing between the runway and the Bravo and Charlie ramps, and use of the helicopter pads and West Field facilities. Figure 3-1 shows noise exposure contours from aircraft activity associated with operations at Marine Corps Air Station (MCAS) Kaneohe. The 65 dBA DNL contour is used for planning purposes as it is considered compatible for all land use developments (MCB Hawaii, 2016). The 65 dBA DNL contour is found mostly on base or over water, except for 38 acres at the northern edge of Coconut Island (Moku-o-loe). The contours represent levels of the A-weighted DNL metric for the existing conditions using calendar year 2019 to avoid any anomalies from COVID-19 pandemic-related operational levels.

3.1.2 Environmental Consequences

3.1.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no change to noise.

3.1.2.2 Alternative 1

Construction Impacts

Construction would result in short-term, intermittent noise impacts from the operation of heavy equipment, power and hand tools, and construction vehicles throughout the project area. Heavy equipment operation would occur sporadically throughout daytime hours. Noise would also be generated by trucks delivering materials to the construction site and construction worker vehicles. There are no sensitive human receptors in the area of the proposed construction footprint and most of the construction would occur in the airfield environment, which is already subject to industrial and aircraft noise. All construction would be confined to MCB Hawaii Kaneohe Bay, be short term and temporary in nature, limited to regular daytime working hours, consistent with existing noise in the airfield environment, and conducted in accordance with Hawaii Administrative Rule (HAR) Chapter 11-46, Community Noise Control. At 50 feet, the loudest construction equipment (a bulldozer) would generate a noise level of 82 dB, at 500 feet this level would decrease to about 54 dB and generate noise levels that would not be distinguishable within the acoustic environment. No on-base housing with sensitive noise receptors is located this close to the project area. Because all construction would occur on the installation and would not be audible to residents outside MCB Hawaii Kaneohe Bay, a Construction Noise Permit would not be needed from the Hawaii State Department of Health (DOH) (see HAR 11-46). Therefore, Alternative 1 construction would have less than significant noise impacts.

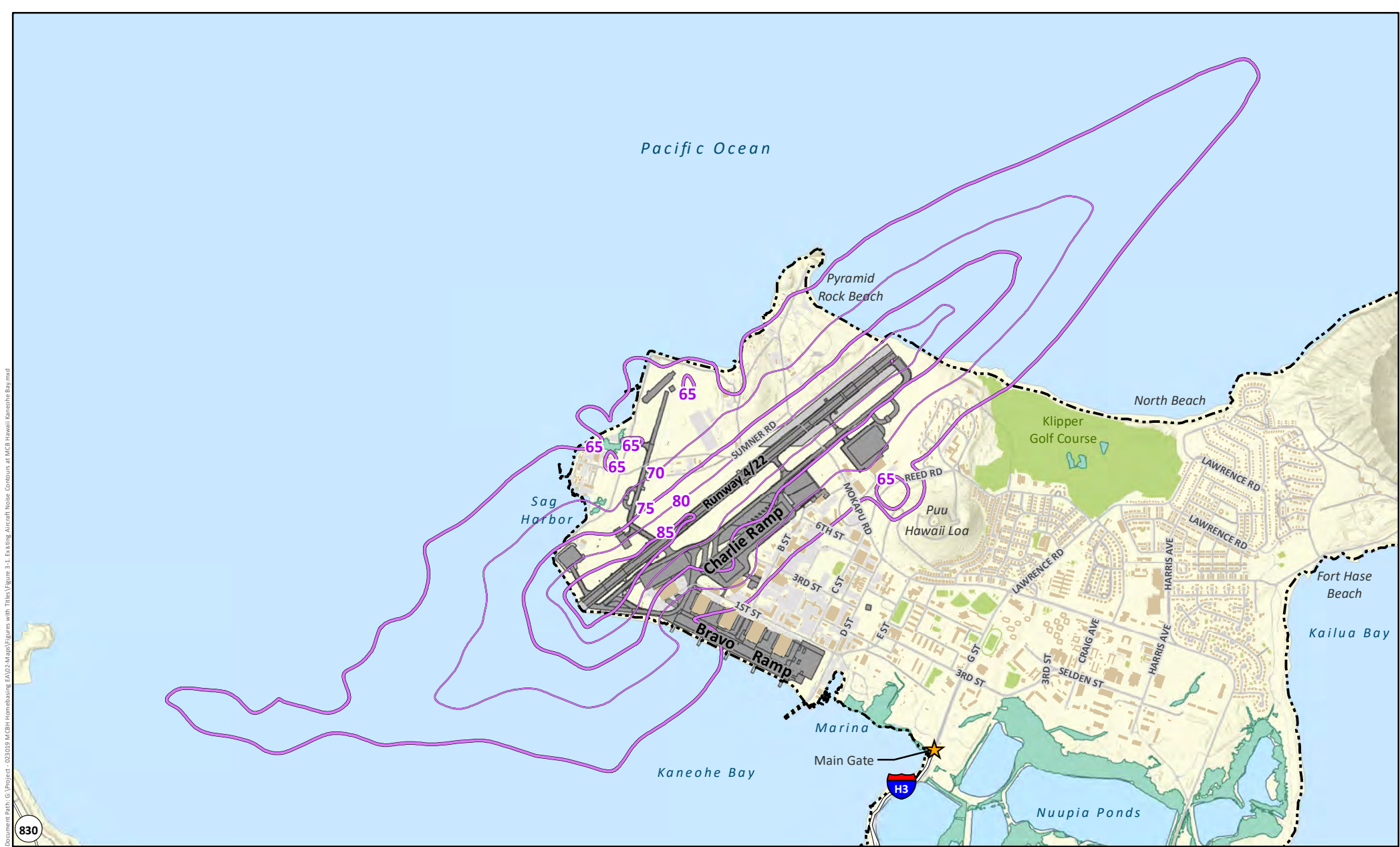
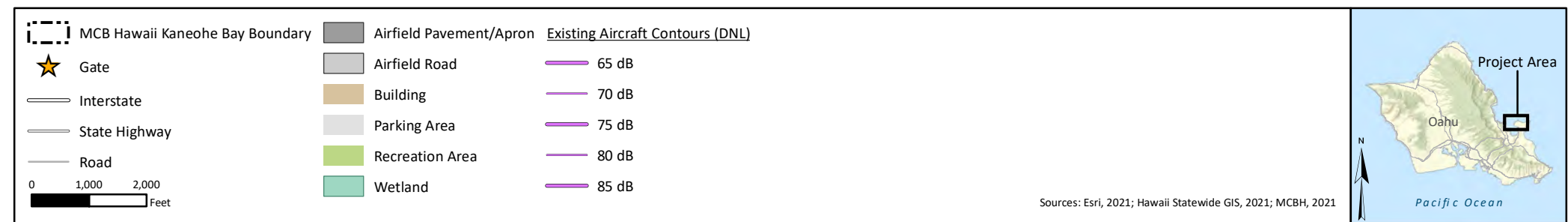


Figure 3-1. Existing Aircraft Noise Contours at MCB Hawaii Kaneohe Bay



Operational Impacts

Figure 3-2 shows contours associated with proposed aircraft operations at MCB Hawaii Kaneohe Bay, and Table 3-1 shows a comparison of acreages within each contour (MCB Hawaii, 2022d). This depiction compares the proposed action contours (in yellow) to the existing contours (in purple). The addition of the KC-130J and MQ-9 squadrons to Kaneohe results in slight growth in the contours throughout the airfield when compared to the No-Action Alternative. Most of the noise areas exposed to the 65 dBA DNL and greater occur on base or over the water. The most notable observable growth is at the very north end of the airfield, in the vicinity of Pyramid Rock, where the contours have expanded over the water due to the left crosswind turns by KC-130J aircraft turning out left just past the upwind runway numbers, for the left closed visual flight rules pattern. This minor increase in contours would not result in a perceptible change to humans or wildlife because the slight increase in the noise contour occurs in an area without sensitive human or wildlife noise receptors. There would be no growth of this contour acreage in populated areas off base, and no residential areas would be exposed to noise above 65 DNL as a result of the proposed action. Although the proposed action would introduce a minor increase in aircraft operations and average noise levels above baseline conditions, the Marine Corps conducted noise modeling that includes aircraft operations associated with the deactivated helicopter squadron for comparison purposes (MCB Hawaii, 2022d). This indicates the net change under the proposed action would be a decrease in noise as measured against historic aircraft operations at the installation prior to 2022. In addition, the proposed aircraft operations would not alter existing noise contours to the extent there would be any impacts to the Air Installations Compatible Use Zone (AICUZ) Program recommendations. Therefore, Alternative 1 would have less than significant impacts to the acoustic environment in and around MCB Hawaii Kaneohe Bay.

Table 3-1 Noise Contour Acreages at MCB Hawaii Kaneohe Bay

<i>Noise Contour</i>	<i>Existing Acreage</i>	<i>Proposed Acreage</i>	<i>Change</i>
65+	1,817	1,978	+161
70+	813	872	+59
75+	394	432	+38
80+	174	194	+20
85+	33	44	+11

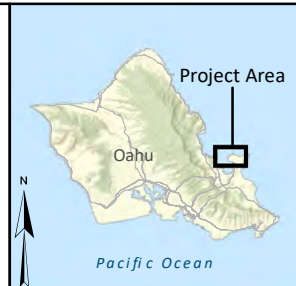
Document Path: G:\Project - 023019 MCBH Homebasing EA\02-Maps\Figures with Titles\Figure 3-2. Proposed Action Noise Contours at MCB Hawaii Kaneohe Bay (compared to Existing Conditions).mxd



Figure 3-2. Proposed Action Noise Contours at MCB Hawaii Kaneohe Bay (compared to Existing Conditions)

MCB Hawaii Kaneohe Bay Boundary		Airfield Pavement/Apron		Existing Aircraft Contours (DNL)		Proposed Action Contours (DNL)	
	Gate		Airfield Pavement/Apron		65 dB		65 dB
	Interstate		Airfield Road		70 dB		70 dB
	State Highway		Building		75 dB		75 dB
	Road		Parking Area		80 dB		80 dB
	0 1,000 2,000 Feet		Recreation Area		85 dB		85 dB
			Wetland				

Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021



3.2 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). The concentration of various pollutants in the atmosphere defines the air quality in a region or at a specific location. Many factors influence a region's air quality, including the type and quantity of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., aircraft, cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Natural sources, such as volcanic eruptions and forest fires, also release pollutants into the air.

3.2.1 Affected Environment

The air quality region of influence includes the east side of the island of Oahu in Honolulu County, where MCB Hawaii Kaneohe Bay is located, and the state of Hawaii for GHGs and climate change effects. The latest data from the DOH (2019) indicates the state is in attainment except for exceedances for sulfur dioxide (SO₂) and particulate matter less than or equal to 2.5 micrometers in diameter (PM_{2.5}) in communities near the volcano on Hawaii Island (State of Hawaii, 2021), which is considered by the U.S. Environmental Protection Agency (USEPA) as a natural, uncontrollable event. Because the state is in attainment of the National Ambient Air Quality Standards (NAAQS), it is not subject to the Clean Air Act's (CAA's) General Conformity Rule.

Emission sources in operation at MCB Hawaii Kaneohe Bay generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators. A corrosion control hangar operates under a DOH Clean Air Branch "non-covered" (i.e., minor) emissions permit (NAVFAC Pacific, 2018).

3.2.2 Environmental Consequences

This analysis evaluates the effects on air quality based on estimated direct and indirect emissions associated with the proposed action.

3.2.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no change to air quality.

3.2.2.2 Alternative 1

Because the state of Hawaii is in attainment of the NAAQS, Alternative 1 is not subject to the CAA's General Conformity Rule. Alternative 1 would involve a change in aircraft operations and a modification to the existing minor stationary source air permit as a result of new and reconfigured buildings. Construction activities during implementation of Alternative 1 would generate short-term, temporary air emissions such as fugitive dust and combustion of fossil fuels from construction equipment.

Construction Impacts

The bulk of the proposed construction and demolition activities would be related to aircraft hangars and pavement. The proposed construction activities would occur over 5 years from 2023 to 2027. To predict air emissions from construction activities, this analysis estimated construction crew and equipment requirements and productivity based on data presented in:

- 2003 RSMMeans Facilities Construction Cost Data, R.S. Means Co., Inc., 2002
- 2011 RSMMeans Facilities Construction Cost Data, R.S. Means Co., Inc., 2010

This analysis determined the quantity and type of equipment necessary to construct the proposed action based on the activities associated with each project element. This evaluation assumes all equipment would be diesel-powered unless otherwise noted. Estimates of equipment emissions were based on the estimated hours of usage and emission factors for each anticipated mobile source. This analysis evaluated nitrogen oxides (NO_x), volatile organic compound (VOC), carbon monoxide (CO), carbon dioxide (CO₂), particulate matter less than or equal to 10 micrometers in diameter (PM₁₀), PM_{2.5}, and SO₂ related to heavy-duty diesel equipment and on road trucks and commuter vehicles from the USEPA’s Motor Vehicle Emission Simulator (MOVES3) emission factor model (USEPA, 2020). The earth disturbance-related fugitive dust emissions were estimated based on the areas with potential ground disturbance and USEPA AP-42 PM emission factors. Table 3-2 summarizes the predicted annual construction emissions under Alternative 1.

The CAA Prevention of Significant Deterioration (PSD) Program applies to major stationary sources of air pollutants and requires a source demonstrate it does not significantly deteriorate the air quality in attainment areas. Under the PSD Program, the CAA identifies Significant Emission Rates for modifications of an existing major source. The emissions shown in Table 3-2 are used to determine *de minimis* emission rates for attainment areas within the region of influence.

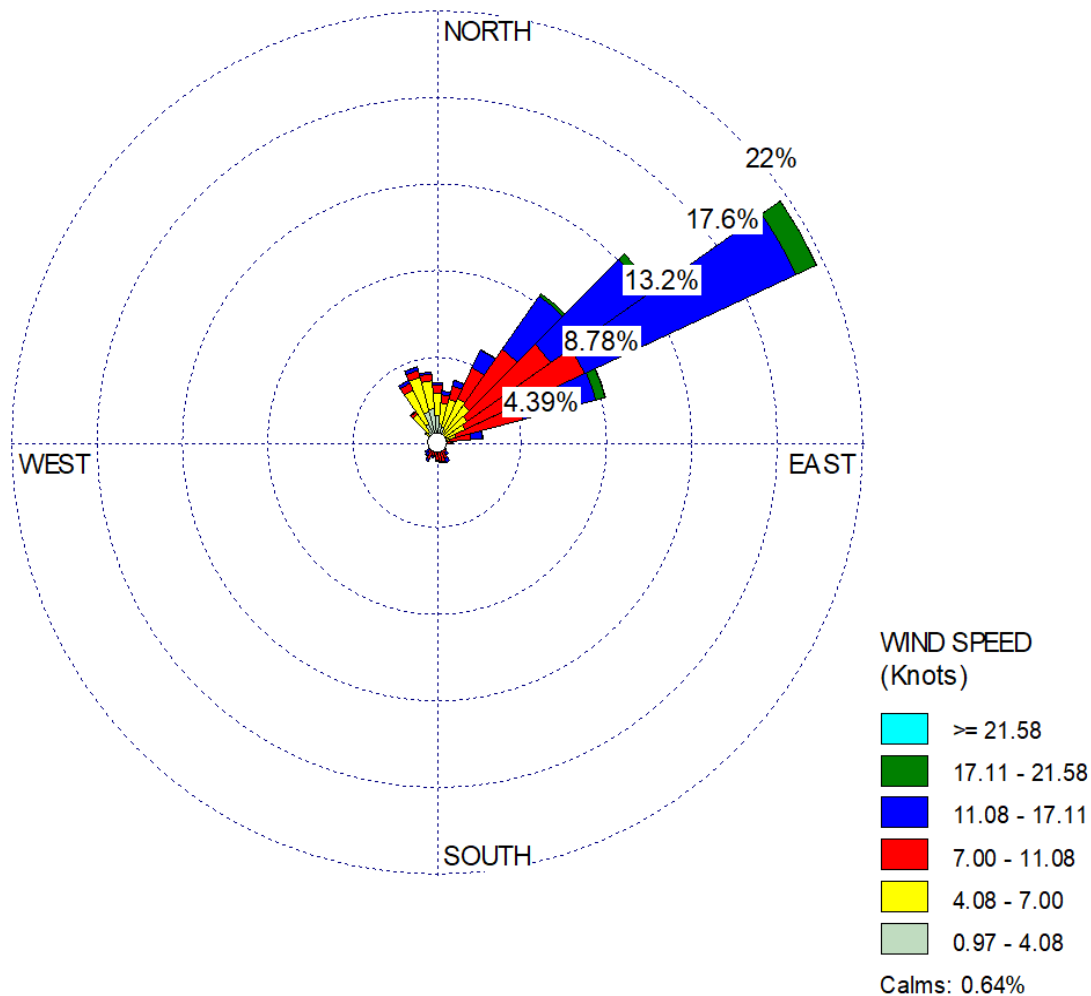
Table 3-2 Alternative 1 Construction Activity Air Emissions Inventory

Year	Emission (tons)						
	VOC	NO _x	CO	PM _{2.5}	PM ₁₀	SO ₂	CO ₂
2023	0.05	0.47	0.75	4.70	0.04	0.00	184.66
2024	0.04	0.38	0.72	0.02	0.04	0.00	160.52
2025	0.03	0.23	0.56	0.01	0.02	0.00	118.90
2026	0.07	0.59	1.59	0.03	0.06	0.00	300.30
2027	0.07	0.59	1.59	0.03	0.06	0.00	300.30
Prevention of Significant Deterioration Threshold	40	40	100	10	15	15	–

Legend: CO = carbon monoxide; CO₂ = carbon dioxide; NO_x = nitrogen oxides; Particulate Matter (PM: PM₁₀ and PM_{2.5} are particles with aerodynamic diameters less than or equal to a nominal 10 and 2.5 micrometers, respectively); SO₂ = sulfur dioxide; VOC = Volatile Organic Compound.

Proposed construction would result in short-term, intermittent air quality impacts on base due to the operation of construction equipment, vehicles, and privately-owned vehicles. Site clearing, grubbing, and grading would result in localized increases in particulate matter; however, all construction-related emissions would be below *de minimis* PSD threshold levels (see Table 3-2) and, thus do not significantly deteriorate the attainment areas of Hawaii and Oahu. All construction activities would comply with the provisions of HAR 11-60.1-33, *Fugitive Dust*. Dust management Best Management Practices (BMPs) such as regular watering, the temporary nature of the impacts, and the distance to the closest downwind sensitive receptors (slightly more than 1 mile to the nearest residential area on Coconut Island), and that the prevailing northeast trade winds around MCB Hawaii Kaneohe Bay (Figure 3-3) quickly disperse air pollutants and lessen the effects of ground-level construction air pollutant emissions from equipment operation and fugitive dust, result in Alternative 1 construction would have less than significant impacts to air quality.

Figure 3-3 Wind Rose, Honolulu 5-year (2014-2018) Hourly Winds



With regards to GHGs, the total GHG emissions in terms of CO₂ exclusively generated within the state of Hawaii from the 5-year construction period would be approximately 1,065 tons. Construction activities associated with Alternative 1 would temporarily increase GHG emissions compared to the No-Action Alternative. Based on the statewide GHG projection of 12.85 million tons of GHGs for 2020 (DOH, 2021a), the estimated annual average GHG increase over the 5-year construction period would be less than 0.002 percent of the 2020 GHG projection. Such a temporary and small annual increase over the 2020 projection level results in a less than significant impact to GHG emissions.

Operational Impacts

Alternative 1 would introduce new air emission sources via home basing new MQ-9 and KC-130J aircraft squadrons. Table 3-3 summarizes the estimated number of additional sorties as compared to the No-Action Alternative on an annual basis.

Table 3-3 Net Change in Annual Aircraft Operations and Engine Maintenance Activities

Scenario	MQ-9		KC-130J	
	LTO	Pattern	LTO	Pattern
Net Change from No-Action Alternative to Alternative 1	250	0	640	1,973

Legend: LTO = Landing and Takeoff; Pattern = Close Pattern Flight.

Air emissions occur during all phases of aircraft operation (landing and takeoff, idling, and in-flight). However, only those emissions emitted in the lower atmosphere’s mixing layer have the potential to result in ground-level ambient air quality impacts. The mixing layer is the air layer extending from ground level up to the point at which the vertical mixing of pollutants decreases significantly. The USEPA recommends a default mixing layer of 3,000 feet be used in aircraft emission calculations (USEPA, 1992). Based on the estimated change in aircraft operation and maintenance activities (see Table 3-3), this analysis estimated the change in aircraft operation air pollutants emissions using the applicable emission factors provided by the Navy’s Aircraft Environmental Support Office (Aircraft Environmental Support Office 2000–2015) and the Air Force’s *Air Emissions Guide for Air Force Mobile Sources* (Air Force Civil Engineer Center, 2018). Table 3-4 summarizes the calculated change in aircraft emissions.

Table 3-4 Incremental Annual Operation Air Emissions

Scenario	Emissions (tons/year)						
	VOC	NO _x	CO	PM _{2.5}	PM ₁₀	SO ₂	CO ₂
Net Change from No-Action Alternative to Alternative 1	3.4	11.8	6.6	5.5	5.5	0.0	4,723
Prevention of Significant Deterioration Threshold	40	40	100	10	15	40	–

Legend: CO = carbon monoxide; CO₂ = carbon dioxide; NO_x = nitrogen oxides; Particulate Matter (PM: PM₁₀ and PM_{2.5} are particles with aerodynamic diameters less than or equal to a nominal 10 and 2.5 micrometers, respectively); SO₂ = sulfur dioxide; VOC = Volatile Organic Compound.

Proposed operations would result in short, intermittent air quality impacts on base due primarily to increased aircraft operations below the 3,000-foot mixing height. However, all emissions are below PSD thresholds and would not affect the state of Hawaii and the island of Oahu’s NAAQS attainment status (see Table 3-4). In addition, the prevailing northeast trade winds around MCB Hawaii Kaneohe Bay (see Figure 3-3) quickly disperse air pollutants and the closest downwind sensitive receptors are slightly more than 1 mile to the nearest residential area. Therefore, Alternative 1 operations would have less than significant impacts to air quality.

Implementation of Alternative 1 would result in an increase of 4,723 tons per year of CO₂ as compared to the No-Action Alternative. This increase in GHG emissions from Alternative 1 was compared to the data available on GHG emissions in Hawaii (DOH, 2021a). As of 2017, the statewide GHG emission limit of 15.28 million metric tons had been reached, and statewide GHG projections of 8.88 million metric tons for 2030 indicate Hawaii is on target to meet its statewide GHG emissions limit after 2020 (DOH, 2021a). Based on this, the estimated GHG increase of 4,723 tons per year (4,284 metric tons per year), which is a .0005 percent increase in CO₂ as compared to 2030 GHG projections, would not significantly impact Hawaii’s ability to meet its GHG goals.

3.3 Water Resources

Water resources include marine waters, groundwater, surface water, wetlands, floodplains, and drainages. This section identifies the existing condition of water resources and analyzes the impacts of the proposed action on those resources. The project area is the area of construction footprint of the proposed action shown in Chapter 2, and immediately adjacent lands. The region of influence for water resources includes the project area as well as the adjacent marine waters of Kaneohe Bay.

3.3.1 Affected Environment

Figure 3-4 shows water features in the region of influence. Proposed activities involve construction for and operation of the two new squadrons. Activities occurring in the portion of the project area near the Kaneohe Bay shoreline would consist of demolition, renovations, and construction upon impervious surfaces that would follow standard construction conservation measures for control of water contamination risk due to runoff. Construction of the new washdown and refueling areas near Hangar 6886 would create 4.25 acres of new impervious surface.

3.3.1.1 Marine Waters

The Bravo Ramp portion of the airfield is adjacent to the marine waters of Kaneohe Bay. HAR 11-54, *Water Standards*, classifies Kaneohe Bay as marine water quality Class AA (DOH, 2021b). Fresh water enters this portion of Kaneohe Bay from rainfall, intermittent small streams, and surface drainage from MCAS Kaneohe Bay. Water in this shallow area mixes slowly with deeper waters of the bay (Kaneohe Bay Information System, 2022). Freshwater mixing within the bay occurs more in the winter; during the summer, fresh water remains at the surface.

3.3.1.2 Groundwater

Groundwater results from the infiltration of water through surface soils and permeable rock materials. The proposed project area is located on the western side of Mokapu Peninsula. Mokapu's thin layer of surface soil, combined with its layer of rock and sediments, provide little depth for groundwater drainage. Groundwater resources at Mokapu Peninsula, including the project area, consist of an unconfined, low salinity caprock aquifer above a confined, freshwater basalt aquifer. There are no potable water wells on the base because the peninsula sits atop an area known to have brackish basal groundwater (Mink and Lau, 1990; Stearns and Vaksvik, 1935; U.S. Geological Survey, 1968).

3.3.1.3 Surface Water

Surface water resources generally consist of ponds, lakes, rivers, and streams. The project area is located within the Koolau Poko watershed (a 65-square mile watershed subdivided into 19 sub-watersheds) and specifically within the Puu Hawaiioloa sub-watershed. Annual rainfall averages 40 inches per year (Rainfall Atlas of Hawaii, 2022). There are no freshwater surface waters in the project area. The closest surface water to the proposed action occurs at the Nuupia Ponds Complex, an estuarine system approximately 0.75 mile southeast of the proposed action. The project area collects and directs storm water runoff from inland areas of Mokapu Peninsula south to the Nuupia Ponds Complex, ultimately connecting to Kaneohe Bay.

3.3.1.4 Wetlands

Wetlands are defined by the USEPA and U.S. Army Corps of Engineers as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil

conditions.” Wetlands generally include “swamps, marshes, bogs and similar areas.” Eight protected wetland complexes are located at MCB Hawaii Kaneohe Bay: (1) Hale Koa Wetland; (2) Sag Harbor Wetland; (3) Salvage Yard Wetland; (4) Percolation Ditch Wetland; (5) Motor Pool Wetland; (6) Kaneohe Klipper Golf Course Ponds; (7) Temporary Lodging Facility Wetland; and (8) Nuupia Pond Complex, a designated and protected Wildlife Management Area (WMA) that harbors endangered flora and fauna. There are no wetlands located within the project area. The closest wetland is the Sag Harbor Wetland, which is about 0.45 miles west of Charlie Ramp (Figure 3-4). The Hale Koa Wetland is located along the coast, northeast of the Sag Harbor Wetland, about 0.5 miles northwest of Runway 04/22 and adjacent to West Field.

3.3.1.5 Floodplains

There are two types of flood-designated areas at MCB Hawaii Kaneohe Bay: flood zones designated by the Federal Emergency Management Agency (FEMA) and shown in Flood Insurance Rate Maps; and floodplains specific to the Mokapu Central Drainage Channel (NAVFAC Pacific, 2017). The project area is in FEMA Zone D, an area where flood hazards are possible, but undetermined (Figure 3-4). Coastal regions adjacent to the project area to the west and north are in FEMA Zones VE (flood hazards are in the 1 percent [%] annual chance coastal floodplains with additional hazards of storm waves) and AE (flood hazards are in the 1% annual chance floodplains).

The proposed action is generally in a developed area with the runway and aviation facilities dominating the western area and a portion of the south edge along Kaneohe Bay. Box culverts drain the runway area southward to the bay. Other box drains discharge runoff for the area west of the runway to the ocean toward the west. The base main cantonment area east of the runway is drained by a series of pipe drain systems to Kailua Bay or overland. A narrow center portion of the base covering an area east of G Street to Craig Avenue is drained by a drainage channel discharging southward into Kaneohe Bay. The east side of the developed main base drains mainly southward via pipe systems and a channel into the Nuupia Ponds.

3.3.2 Environmental Consequences

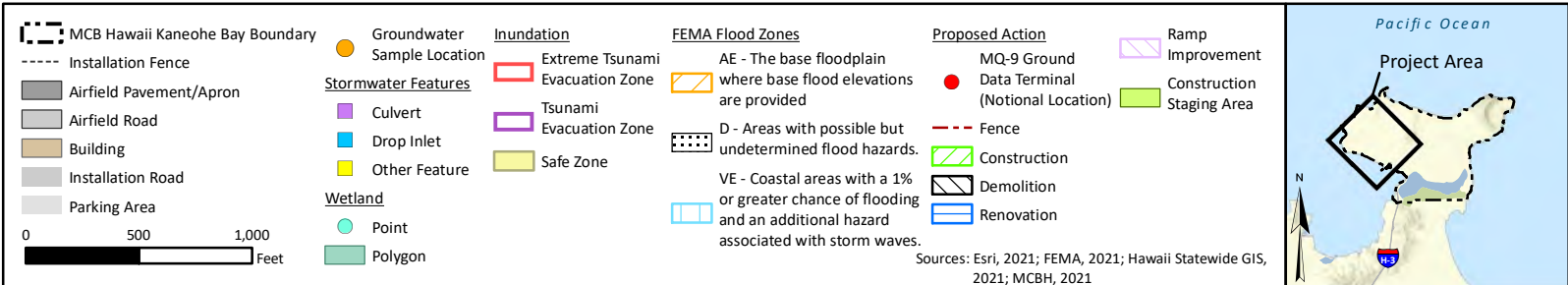
This analysis focuses on the potential impacts of the proposed action on marine waters, groundwater, surface water, wetlands, and floodplains. Impacts to drinking water are not assessed as there are no potable water wells on the base. Groundwater analysis focuses on the potential for impacts to the quality, quantity, and accessibility of groundwater; and marine and surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction proposed is within a floodplain and whether the project may impede the functions of floodplains and drainage systems in conveying floodwaters.

3.3.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no change to water resources.



Figure 3-4. Water Resources and Flood Zones at MCB Hawaii Kaneohe Bay



3.3.2.2 Alternative 1

Construction Impacts

The construction supporting the proposed action would involve renovation and replacement of facilities, with new facilities being constructed in mostly impervious surface areas, with two exceptions: the proposed KC-130J Aircraft Direct Refueling System and a portion of the proposed KC-130J wash rack and storage facility (see Figure 2-6). Construction of these two projects would not disturb marine waters, groundwater, surface waters, or wetlands. The project design features in Table 2-5 (such as bioretention, vegetated swales, underground chambers, and pervious pavement) would be implemented to manage storm water volumes and avoid any potential flooding or ponding at or near the project area. Therefore, there would not be an increased volume of water entering wetlands in the immediate vicinity of the project area. Use of the adjacent Construction Staging Area would be managed with appropriate conservation measures to reduce any temporary risk of increases in runoff and pollution. This project area does not overlie a drinking water source and is not located near any freshwater surface waters or wetlands.

During all construction activities, site preparation, grading, grubbing, demolition of existing facilities, and utility trenching may indirectly result in soil erosion, sedimentation, and transport of pollutants with a potential to reach downstream waters. A CWA-mandated NPDES permit would be required for the proposed action. This NPDES storm water permit would include development of a site-specific construction Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would identify BMPs such as runoff detention basins and silt fencing to reduce the potential for soil, sediment, and pollutants to be transported off-site. Application of conservation measures described in Section 2.3, along with the additional NPDES permit conditions and LID site design features, minimize runoff and prevent or minimize the pollutants and sediment conveyed by surface runoff, ensuring that adverse impacts to wetlands and surface waters are less than significant. Conservation measures for sediment control include the use of silt fences, storm drain inlet protection measures, sediment traps, and sediment basins. Removed materials, debris, and soil resulting from construction activities would be contained and properly disposed of in accordance with applicable regulations.

Operational Impacts

Following construction, all storm water runoff from operations would be managed by existing on-site storm drainage infrastructure. The proposed KC-130J Aircraft Direct Refueling System would have a 3.77-acre footprint located approximately 0.5 mile from any water resource, and it would be managed like the other refueling locations at the airfield. The KC-130J Aircraft Direct Refueling system would be located on an impervious surface, with dedicated valving, meters, control valves, and instrumentation, designed to capture and contain any potential fuel spills or leaked fuel exiting the fuel pit, thereby preventing any potential spill from entering the storm water system. Furthermore, the proposed location is being sited approximately 3,000 feet from freshwater resources and 1,800 feet from the nearest point of Kaneohe Bay to further reduce the possibility of any potential spill impacting freshwater resources or Kaneohe Bay.

The proposed wash rack would have a footprint of 0.45 acre and is located approximately 1,500 feet from any water resource. It would be constructed in a partly open area near Hangar 6886 and consist of an impervious surface like other wash racks at the airfield. The wash rack would be designed and operated in accordance with LID protocols such as the use of an oil/water separator to handle the rinse water before it is discharged into the sewer system to control and reduce runoff before it enters piped and lined channels for off-site discharge. The Marine Corps conducts required periodic water quality

testing for all wash rack facilities, and this would be the same for the proposed wash rack under Alternative 1. The oil/water separators are cleaned and analyzed for volatiles, polychlorinated biphenyls, oil range organics, and metals on a normal maintenance schedule every 5 years.

Approximately 4.25 acres of new impervious surface area at the installation would result from the proposed action. This is a small change in impervious area at the installation representing only a 2% increase in impervious areas along the flightline and less than 1% increase of the impervious areas on the installation. As discussed above, all new facilities would be constructed with LID elements and appropriate conservation measures to maintain storm water discharge to pre-development hydrologic conditions and the storm water pollution control measures would comply with the installation NPDES MS4 permit. As such, this small increase in impervious surface consisting of activities presently found on MCAS Kaneohe Bay, results in less than significant increases in the amount and type of storm water flow going into Kaneohe Bay from current conditions.

Although the proposed action would introduce an increase in personnel compared to baseline conditions, the net change would be a decrease of personnel when considered with historic fluctuations of personnel at the installation in years prior to 2022 (see Chapter 4, *Cumulative Effects*). The change in facility footprints and personnel would be accommodated by the current infrastructure.

For the reasons described above, Alternative 1 would have less than significant impacts to water resources.

3.4 Cultural Resources

Cultural resources are the physical evidence or places of current and past human activity. This analysis of cultural resources addresses two major categories: archaeological and architectural. Archaeological resources are locations where human activity measurably altered the earth and/or left deposits of physical remains, and architectural resources include standing buildings, structures, and other built-environment resources of historic or aesthetic significance. Archaeological and architectural resources can be grouped together to comprise a district or landscape.

Traditional cultural properties are “eligible for inclusion in the NRHP based on associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community” (National Park Service, 2012). No known traditional cultural properties (TCPs) exist in the project area or on the Mokapu Peninsula (Tomonari-Tuggle, 2014; MCB Hawaii, 2018). MCB Hawaii contacted NHOs affiliated with Mokapu Peninsula, and they did not identify TCPs associated with the project area, nor did they propose new TCPs for listing. Therefore, no further analysis of TCPs is included in this EA.

MCB Hawaii initiated Section 106 consultation with Hawaii SHPD for the undertaking on 6 January 2022 and is conducting Section 110 consultation with the National Park Service. MCB Hawaii determined the proposed undertaking would result in an adverse effect on historic properties. In a letter dated 7 February 2022, the SHPD concurred with the determination of adverse effect and directed MCB Hawaii to take into consideration comments received from the public and interested parties, which may result in the identification of additional historic properties and/or raise additional concerns regarding project impacts, as part of the Section 106 consultation process. Consultations will continue through the fall of 2022 as a MOA is developed to mitigate adverse effects to historic properties.

3.4.1 Affected Environment

The project area of potential effects (APE) includes the location of the proposed action, as well as areas outside the project area that may be affected by construction activities or the presence of the new facilities. The APE for the project consists of the NAS Kaneohe NHL District; the NAS Kaneohe Historic Aviation District (Aviation District); the Mokapu House Lots Archaeological District at Pali Kilo; and areas adjacent to the Aviation District along First Street, in West Field, south and east of Charlie Ramp, and north and east of the transient ramp (Figure 3-5).

3.4.1.1 Historical Background

The project area is in the western portion of the Mokapu Peninsula, which lies within the traditional Hawaiian moku (district) of Koolaupoko. One of six districts of Oahu, Koolaupoko is divided into 11 *ahupua'a* (traditional land divisions that are further divided into *'ili* [traditional land subdivisions]). Mokapu Peninsula falls within two different *ahupua'a*: Heeia in the west and Kaneohe in the east (Tuggle and Hommon, 1986). The peninsula was divided further into seven *'ili*, including the westernmost *'ili* of Mokapu.

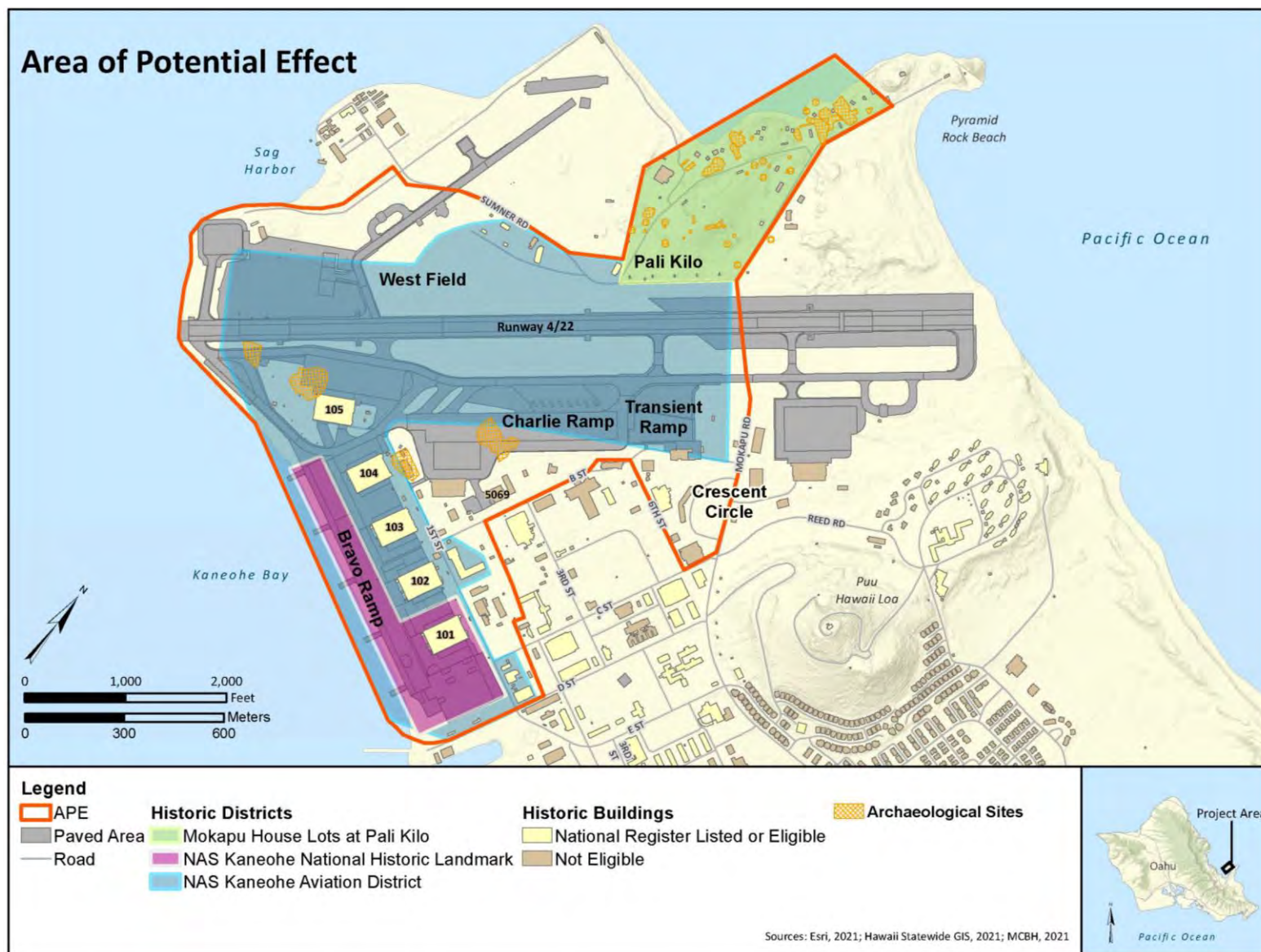


Figure 3-5 Area of Potential Effects

Archaeological evidence indicates that people lived on or came to Mokapu Peninsula at least 500 to 800 years before Western Contact (Tomonari-Tuggle and Clark, 2021). The occupants of the peninsula employed small-scale subsistence farming and fishing and intermittently inhabited areas for resource cultivation or gathering. They developed fisheries, fishponds, fish traps, and fishing shrines as part of a robust system of aquaculture, fishing, and marine resource collection. The inhabitants of the peninsula most likely continued their traditional way of life based on fishing and subsistence farming well after Western contact in 1778 and into the 19th century. In Hawaiian archaeology, the year 1778 is typically defined as the divide between the “Pre-contact” and “Post-contact” periods. In some areas, such as Mokapu, change was slow to appear, and traditional lifeways continued for several decades after initial contact (MCB Hawaii, 2018).

At the beginning of the 20th century, the population of Mokapu Peninsula was sparse, and the area was dominated by grazing, farms, and fishponds. The first military land use began on the peninsula with the establishment of the U.S. Army’s Kuwaaohē Military Reservation in 1918. It was not extensively developed and was deactivated and leased for ranching after World War I (MCB Hawaii, 2018).

With the construction of the installation known as NAS Kaneohe Bay in 1939, a new military presence on the peninsula began in response to the looming threat of WWII. The Navy first acquired the Heleloa tract (former Heleloa ‘ili) for a seaplane base, followed by the Mokapu tract (former Mokapu ‘ili) for a land-based airfield. Much of the initial work of constructing the base was dredging and filling; on the bay side, these activities deepened the water landing zone and expanded the peninsula by 280 acres, transforming much of the western coastline. Figure 3-6 shows the historic coastline prior to the 1939 development and expansion of the installation. Most of Bravo Ramp and associated hangars (Hangars 101, 102, 103 and a portion of 104) are located on fill material placed after 1928. In addition, these fill materials are in an area that was nearshore waters of the bay, so subsurface archaeological deposits are unlikely in this area.

Between 1941 and 1945, the Army and the Navy substantially expanded operations and installations in Hawaii. In tandem with the Navy’s development of what was then known as NAS Kaneohe Bay, the Harbor Defenses of Kaneohe Bay were established as a new command of the U.S. Army’s Coast Artillery Corps. Part of an internationally significant event that changed the course of world history, NAS Kaneohe Bay was targeted in the 7 December 1941 Japanese attack on Oahu, suffering substantial damage, especially to its hangars and aviation areas. The U.S. entry into WWII immediately after the attack accelerated construction of NAS Kaneohe Bay with rapid construction of additional aviation facilities and cantonment areas. Expansion focused on accommodating units that were transiting to the Pacific front near Japan.

Major military construction ceased at the end of WWII. NAS Kaneohe Bay was decommissioned in 1949. As Cold War tensions rose in the Pacific, in January 1952, NAS Kaneohe Bay was reactivated as MCAS Kaneohe amid the U.S. military’s renewed focus in the Pacific theater in response to the Korean War. Both NAS Kaneohe Bay and the Army’s Fort Hase were incorporated into one installation covering the entire peninsula as MCAS Kaneohe Bay.

The Marine Corps consolidated their property and commands under MCB Hawaii Kaneohe Bay on 15 April 1994. This became the headquarters for MCB Hawaii, a single command that includes seven other noncontiguous installations in the state (MCB Hawaii, 2018).

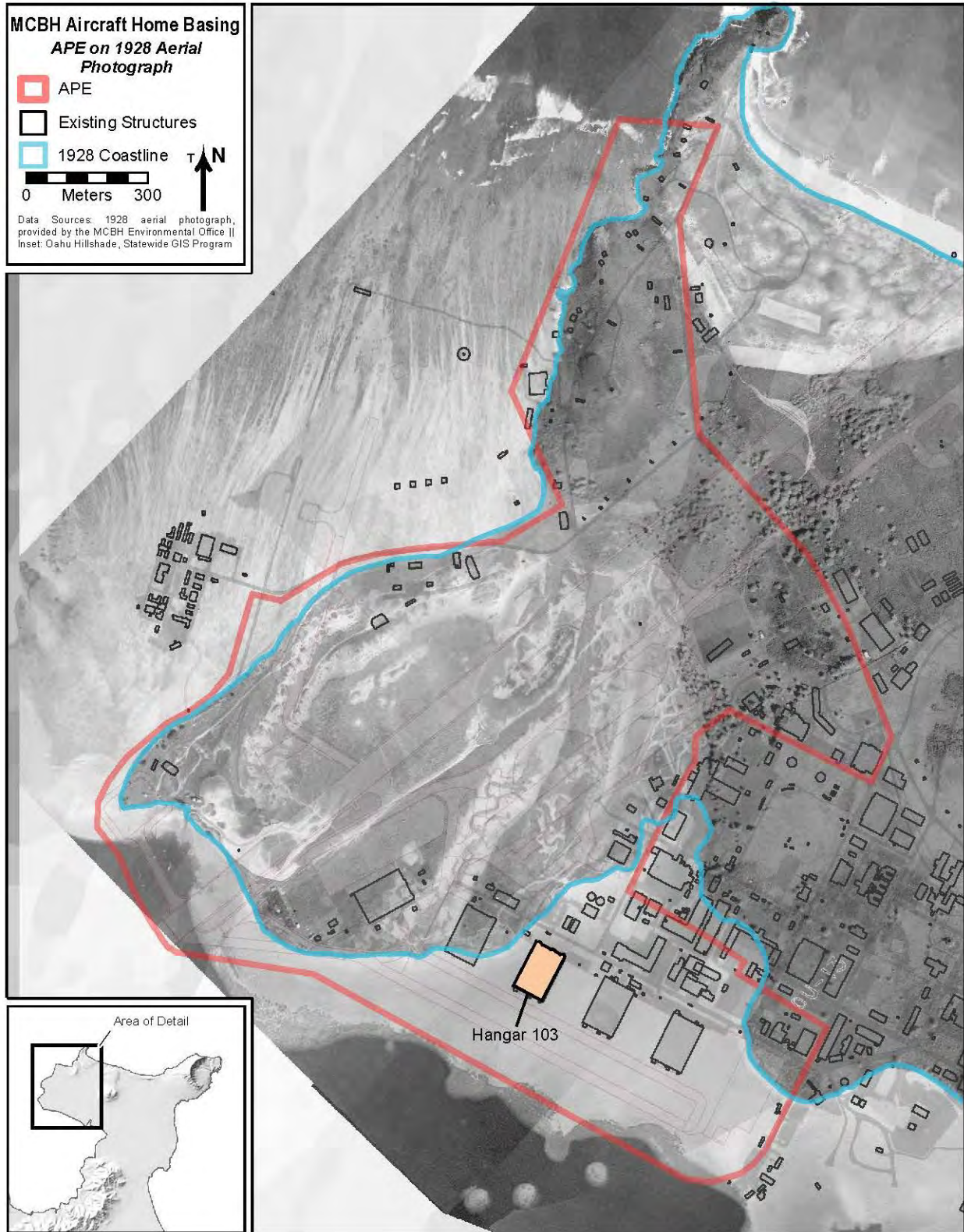


Figure 3-6 Historic Coastline at MCB Hawaii Kaneohe Bay

3.4.1.2 Archaeological Resources

MCB Hawaii conducted numerous inventories of cultural resources to identify properties that are eligible for listing in the NRHP. The results of these studies are summarized in MCB Hawaii's *Integrated Cultural Resources Management Plan* (Tomonari-Tuggle and Clark, 2021), and *Cultural Landscape Report* (MCB Hawaii, 2018). Within the APE boundary are 31 documented archaeological sites. They can be divided into three age and functional categories: traditional Hawaiian, non-military historic, and military historic. Typical of the Mokapu Peninsula, most sites are traditional Hawaiian in association, including six surface sites identified by their Hawaii State Inventory of Historic Properties site numbers: (50-80-11-365, 367, 4616, 4619, 4620, and 4622) and eight subsurface sites (50-80-11-2883, 4453, 4933, 5733, 5829, 7722, 7723, and 7724). Twelve sites (50-80-11-4610, 4611, 4612, 4613, 4614, 4617, 4618, 4621, 4624, 4625, 5968, and 7725) are associated with non-military historic-period activities. Finally, five are military sites associated with WWII (50-80-11-2884, 4615, 4623, 5969, and 7726). Additionally, two traditional subsurface sites (50-80-11- 1017 and 4891) are located outside, but within 60 meters of the APE.

These sites generally cluster in two locations:

- The northern cluster centered on the slopes of Pali Kilo includes sites from all three periods, both subsurface and aboveground. Relatively little development or land modification has occurred in this area in comparison to the flightline and aviation areas in the APE. At least 16 sites in this area are considered contributing to the NRHP-eligible Mokapu House Lots Archaeological District (Table 3-5).
- The southern cluster of archaeological sites within the APE includes three subsurface traditional Hawaiian cultural deposits (50-80-11-4453, 4933, and 5829, which also contains non-military historical materials) east of the runway near Kaneohe Bay. These sites are below the fill land that underlays much of the flightline. While previous surface components of these sites were destroyed during early 20th-century land reclamation and the construction of the runway, archaeological monitoring of construction projects has encountered several areas of intact subsurface cultural deposits southeast of the runway. These sites, in sandy deposits of a former estuary, represent traditional Hawaiian habitation and contain firepits, post molds, shell midden and artifacts, charcoal, and intact burials. More than 1,500 sets of human remains have been uncovered across Mokapu Peninsula, with two primary burial areas within the northern dunes (Mokapu Burial Area, Site 1017), and Ulupau Dune along the peninsula's East Coast (Tomonari-Tuggle and Clark, 2021:II-60). These are outside the APE, though the Mokapu Burial Area is near the northeastern edge of the APE.

Table 3-5 Archaeological Sites Within the APE

SIHP Site No. 50-80-11-	District/ Area	Period^a	Site Description^a	NRHP Status (Significance Criterion)	References
365	MHLAD; MPPA (Proposed) ^b	TH	Possible remnants of <i>heiau</i> ; on southern slope of Keawanui; location of St. Catherine’s Catholic Church in 1840s; O’Day, 2007 suggests that Sites 4619, 4620, 4622, and Temp Site 1 could define two sides of <i>heiau</i>	NRE-yes (Criterion D) ^b	Thrum, 1915; MacCaughey, 1917; McAllister, 1933; Ruzicka and O’Day, 2005; O’Day, 2007; Nickelsen and Kirkendall, 2008a
367	MHLAD; MPAA (Proposed)	TH	Hina Stone; elongated waterworn boulder; one of three features including a fishing shrine with two uprights representing Kane and Kanaloa, a fish trap (Pa Ohua), and shrine with two stones representing Ku and Hina; damaged in 2009	NRE-yes (Criteria B, C, D)	MacCaughey, 1917; McAllister, 1933; Drolet et al., 1996; Schilz et al., 1996; Ruzicka and O’Day, 2005; Nickelsen and Kirkendall, 2008b
2883	MHLAD; MPAA (Proposed)	TH; NM	Subsurface cultural deposits from pre- and post-Contact periods and pre-WWII house sites; pre-Contact deposit possibly continuous with 5733	NRE-yes (Criterion D)	Barrera, 1982; Tuggle and Hommon, 1986; Drolet et al., 1996; Anderson, 1998; Ruzicka and O’Day, 2005; O’Day, 2007; Nickelsen and Kirkendall, 2008c
2884	--	M	Four concrete house foundations, ca. WWII	NRE-yes (Criteria not given)	Tuggle and Hommon, 1986; Drolet et al., 1996; Prishmont et al., 2001
4453	MPAA (Proposed)	TH	Subsurface cultural deposit with pit features, postmolds, shell midden, charcoal; intact burials	NRE-yes (Criterion D)	Charvet-Pond and Rosendahl, 1992a, 1992b; Prishmont and Anderson, 2000; Prishmont et al., 2001; Gosser et al., 2002; Rasmussen, 2007; Nickelsen and Kirkendall, 2008d; Walker et al., 2022.
4610	MHLAD	NM	House terrace/complex	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O’Day, 2005; Gosser et al., 2015
4611	MHLAD	NM	House site; pre-WWII	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O’Day, 2005
4612	MHLAD	NM	House site; pre-WWII to 1943	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O’Day, 2005; Allen, 2013
4613	--	NM	Stone wall and historic walkway	NRE-yes (Criterion D)	Drolet et al., 1996; Allen, 2013
4614	MHLAD	NM	House site; pre-WWII	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O’Day, 2005; Allen, 2013

Table 3-5 Archaeological Sites Within the APE

SIHP Site No. 50-80-11-	District/Area	Period^a	Site Description^a	NRHP Status (Significance Criterion)	References
4615	--	M	Underground storage room; exterior door labeled "Paint Locker;" probable post-WWII	NRE-yes (Criteria not given)	Drolet et al., 1996; Allen, 2013
4616	MPAA (Proposed)	TH	Low basalt cobble and boulder wall	NRE-yes (Criterion D)	Drolet et al., 1996; Nickelsen and Kirkendall, 2008e
4617	MHLAD	NM	House site; pre-WWII	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O'Day, 2005
4618	MHLAD	NM	Building cluster; pre-WWII	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O'Day, 2005
4619	MHLAD; MPAA (Proposed)	TH	Pavement w/ 2 waterworn uprights; on slope of Keawanui Hill; may be	NRE-yes (Criteria C, D)	Nickelsen and Kirkendall, 2008f; Ruzicka and O'Day, 2005
4620	MHLAD	TH	Enclosure; circular; on upper east facing slope of Keawanui Hill; may be part of Site 365 <i>heiau</i>	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O'Day, 2005; O'Day, 2007; Nickelsen and Kirkendall, 2008g
4621	--	NM	Building foundation	n/a	Drolet et al., 1996
4622	MHLAD; MPAA (Proposed)	TH	Rock and coral piles; may be part of Site 365 <i>heiau</i>	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O'Day, 2005; O'Day, 2007; Nickelsen and Kirkendall, 2008h
4623	MPAA (Proposed)	M	C-shaped structure; corrugated tin and glass bottles on surface; probable military	NRE-yes (Criterion D)	Drolet et al., 1996; Ruzicka and O'Day, 2005; O'Day, 2007; Nickelsen and Kirkendall, 2008i; Allen, 2013
4624	MPAA (Proposed)	NM	Enclosure; low walls, rectangular, 11 x 7 m; concrete slab fragment on surface; probably historic-period house	NRE-yes (Criterion D)	Drolet et al., 1996; O'Day, 2007; Nickelsen and Kirkendall, 2008j; Allen, 2013
4625	MHLAD	NM	House site; pre-WWII	NRE-yes (Criterion D)	Ruzicka and O'Day, 2005
4933	MPAA (Proposed)	TH	Subsurface cultural deposit with pits, postholes, firepits; bone arrow point	NRE-yes (Criterion D)	Schilz and Allen, 1996; Rechtman and Wolforth, 2000; Allen, 2000; Prishmont et al., 2001; Gosser et al., 2002; Nickelsen and Kirkendall, 2008k
5733	MPAA (Proposed)	TH; NM	Subsurface cultural deposits; traditional Hawaiian and 19 th century; 20 th century house and yard; in dune on west-facing slope of Pali Kilo	NRE-yes (Criterion D)	Rosendahl, 1999; O'Day, 2007; Nickelsen and Kirkendall, 2008l; Gosser et al., 2015

Table 3-5 Archaeological Sites Within the APE

<i>SIHP Site No. 50-80-11-</i>	<i>District/Area</i>	<i>Period^a</i>	<i>Site Description^a</i>	<i>NRHP Status (Significance Criterion)</i>	<i>References</i>
5829	MPAA (Proposed)	TH	Subsurface cultural deposit, burials; around Building 6470, north of Hangar 104	NRE-yes (Criterion D)	Prishmont et al., 2001; Roberts et al., 2002; Dixon et al., 2002; Nickelsen and Kirkendall, 2008m; Allen and Rieth, 2014; Allen, 2015; Barna et al., 2017
5968	--	NM	Historic basalt retaining wall, possibly associated with the Mokapu Experimental Game farm	TBD ^b	Roberts et al., 2002
5969	--	M	Concrete foundation; immediately west of Keawanui	TBD	Roberts et al., 2002
7722	MHLAD	TH	Subsurface cultural deposit	NRE-yes (Criteria C, D)	Gosser et al., 2015
7723	--	TH	Intact but disturbed human burial remains; sparse traditional Hawaiian artifacts	n/a	Gosser et al., 2015
7724	MHLAD	TH	Disturbed subsurface cultural deposit (including one human tooth)	NRE-yes (Criteria C, D)	Gosser et al., 2015
7725	MHLAD	NM	Retaining wall	NRE-yes (Criteria C, D)	Gosser et al., 2015
7726	--	M	Concrete foundations; WWII-era	NRE-no	Gosser et al., 2015

Notes: ^a Site descriptions and period designations are reproduced from the updated ICRMP (Tomonari-Tuggle and Clark, 2021:Table II-7).

^b MHLAD: Mokapu House Lots Archaeological District; MPAA (Proposed): Mokapu Peninsula Archaeological Area (Proposed). M: Military. NM: Non-military Historic. TH: Traditional Hawaiian. NRE: National Register eligible; TBD: to be determined (no eligibility evaluation).

^c Site is located within 60 meters of the APE.

^d Site is located within 5 meters of the APE.

Archaeological sensitivity varies across the peninsula. Sensitivity zones at MCB Hawaii Kaneohe Bay, including the area of the current APE, are described in the Integrated Cultural Resources Management Plan (ICRMP) (Tomonari-Tuggle and Clark, 2021). As shown in Figure 3-6, land in the western and southern portions of the APE consist of fill deposited on marine sediments and has the potential for intact archaeological resources. Parts of the APE in the original extents of Mokapu Peninsula prior to land reclamation range from low to high archaeological sensitivity, with the highest sensitivity areas at, and north of, Pali Kilo; and near the former estuary along Kaneohe Bay. In the latter area, fill often overlays intact natural sediments that may include archaeological deposits. Land modification was less intensive in the northern portion of the APE (at Pali Kilo), and both surface and subsurface archaeological resources may be encountered. In the event of inadvertent discoveries of *iwi kūpuna* (Native Hawaiian human remains) or associated objects, established Native American Graves Protection and Repatriation Act (NAGPRA) regulations direct the subsequent response. MCB Hawaii takes stewardship of these archaeological resources seriously and has established and disseminated processes to follow in the event of an inadvertent discovery of *iwi kūpuna*. Currently, a Standard Operating Procedure in the 2021 MCB Hawaii ICRMP is to be followed if human skeletal remains are found (ICRMP Standard Operating Procedure 6, Tomonari-Tuggle and Clark, 2021). Moving forward, MCB Hawaii is developing a NAGPRA Comprehensive Agreement, which will supersede this Standard Operating Procedure.

3.4.1.3 Architectural Resources

The APE encompasses historic architectural resources that are NRHP listed or eligible (Figure 3-7; Table 3-6). These include buildings and structures that are both individually eligible or contribute to one or both of two historic districts: the NRHP-listed NAS Kaneohe NHL District and the NRHP-eligible NAS Kaneohe Aviation District. The NRHP defines the listed NHL as possessing exceptional significance for its association with the 7 December 1941 Japanese attack on Oahu. As summarized in the NHL nomination form, the “historic district includes the following nationally significant features: hangar no. 1 [Hangar 101], the parking area between the hangars and Kaneohe Bay [a portion of this area is referred to as Bravo Ramp], and the five ramps [seaplane ramps].” Hangars 102 and 103, built in 1941, the three ancillary aircraft spares storage buildings (Buildings 159, 160, and 161) built in 1942, and Buildings 183 and 184 (built in 1942-1943) are individually NRHP-eligible and are also contributing resources to the NRHP-eligible Aviation District. Although not part of the proposed action, the historic Hangar 104 and Hangar 105 complete the line of historic hangars between 1st Street and Bravo Ramp. All the hangars (101 through 105) are contributing resources to the Aviation District. The NAS Kaneohe Aviation District is significant for its association with the buildup of the NAS prior to and during WWII.

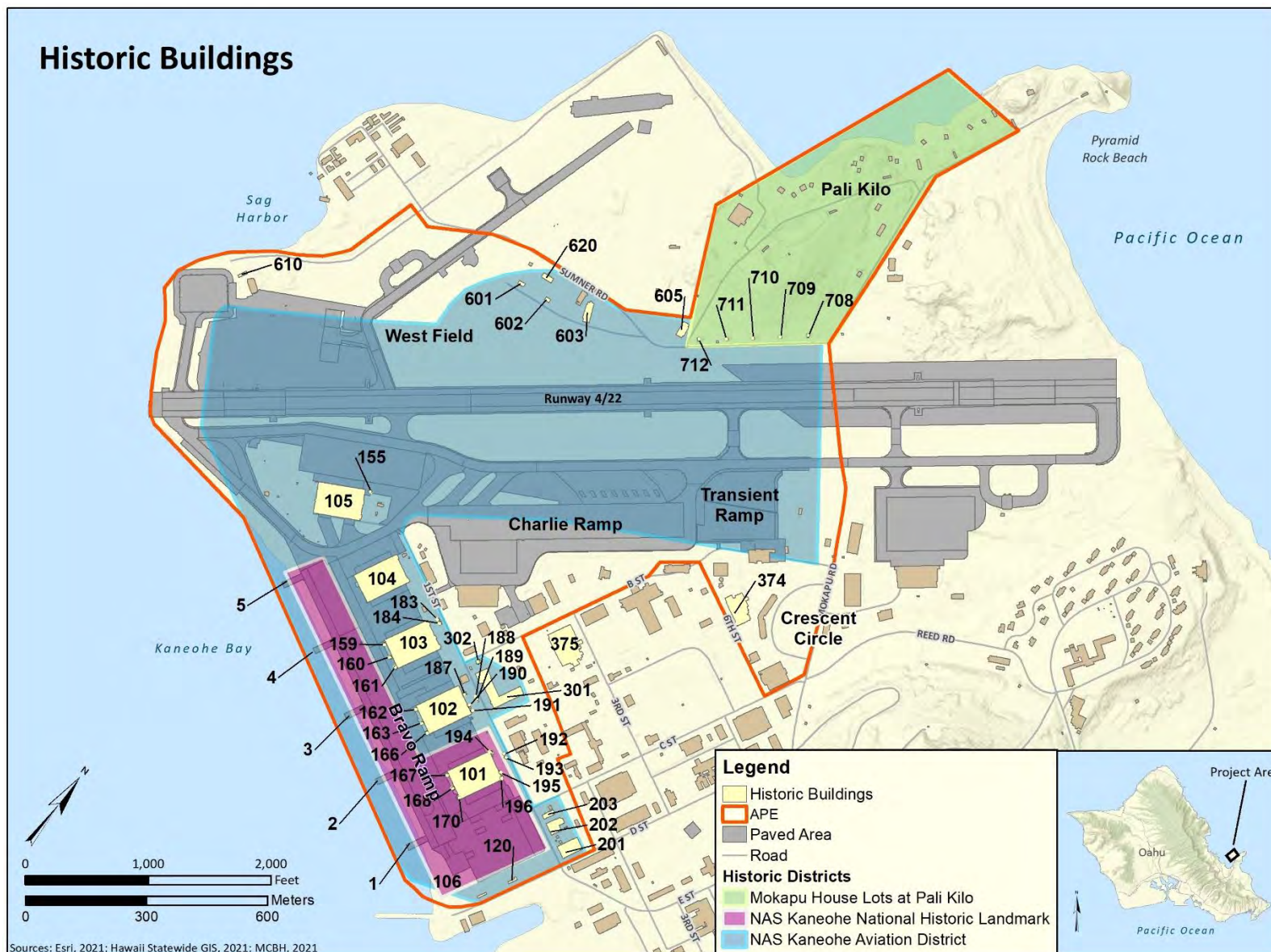


Figure 3-7 Historic Properties, Including Architectural Resources and Historic Districts, Within the APE

Table 3-6 Summary of Existing Architectural Resources Within the APE





Name/Building #	Year Built	Evaluation of Significance	Status	Photo
NHL and Aviation District				
Seaplane Ramps (5) Facilities 1-5	1940	Contributing resource to the Kaneohe NAS NHL District and the Aviation District. Existed at the time of the 7 December 1941 attack and came under fire during the attack. Part of the 1939 initial proposed base layout and critical to the primary purpose and mission of the original base.	Extant	
Hangar 101 / Maintenance Hangar 1 Building 101	1941	Contributing resource to the Kaneohe NAS NHL District and the Aviation District. Existed at the time of the 7 December 1941 attack. Bombed and strafed during the attack. Designed by the architectural firm of Albert Kahn.	Extant	
Bravo Ramp and Parking Apron No Building #	1939	Contributing resource to the Kaneohe NAS NHL District and the Aviation District. One of the primary targets of the 7 December 1941 Japanese attack. Strafing marks from the attack remain.	Extant Repaving work as part of Home Basing project	
Aviation District				
Hangar 102 / Maintenance Hangar 2 Building 102	1939/ 1941	Contributing resource to the Aviation District. One of the first buildings built on the NAS (the original 1939 portion is approximately one-fourth the size of the current footprint). Original version existed at the time of the 7 December 1941 attack. Mostly undamaged by surrounding bombing and strafing during the attack. Designed by the architectural firm of Albert Kahn.	Extant Renovation work as part of Home Basing project	

Table 3-6 Summary of Existing Architectural Resources Within the APE

Name/Building #	Year Built	Evaluation of Significance	Status	Photo
Hangar 103 / Maintenance Hangar 3 Building 103	1941	Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Sustained minor damage from the bombing and strafing during the attack. Designed by the architectural firm of Albert Kahn.	Proposed demolition and replacement as part of Home Basing project	
Hangar 104 / Maintenance Hangar 4 Building 104	1941	Contributing resource to the Aviation District. Under construction at the time of the 7 December 1941 attack. Designed by the architectural firm of Albert Kahn.	Extant	
Hangar 105/ Maintenance Hangar 5 Building 105	1943	Contributing resource to the Aviation District. Built as a land plane hangar during WWII. Designed by the architectural firm of Albert Kahn.	Extant Currently located in runway clear zone	
Aircraft Spares Storage Buildings 159-163, 166-168, 170, 183, 184, 187-196	1942-1943	Contributing resources to the Aviation District. Part of WWII base build-up. Concrete hangar support buildings located primarily near Hangars 101–104. Originally stored aircraft armament and supplies.	Facilities 159-161, 183-184 Proposed demolition as part of the Home Basing project Facilities 162-163, 166-168, 170, 187-196 Extant	
Shop Maintenance Elect-Refrig/ Public Works Shop Building 201	1941	Former Utilities Shop and Parachute Loft Stowage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Part of a group of three associated early base support buildings (with Buildings 202 and 203). Part of the 1939 initial proposed base layout. Designed by the architectural firm of Albert Kahn.	Extant	
Shop, Maintenance Machine/Public Works Shop Building 202	1941	Former Torpedo Workshop Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941	Extant	

Table 3-6 Summary of Existing Architectural Resources Within the APE







Name/Building #	Year Built	Evaluation of Significance	Status	Photo
		<p>attack. Part of a group of three associated early base support buildings (with Buildings 201 and 203). Part of the 1939 initial proposed base layout. Designed by the architectural firm of Albert Kahn.</p>		
<p>Public Works Shop, Grounds/Jan/Pest Control/Public Works Shop Building 203</p>	<p>1941</p>	<p>Former Bombsight Workshop and Storage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. One of three associated early base support buildings (with Buildings 201 and 202). Part of the 1939 initial proposed base layout. Designed by the architectural firm of Albert Kahn.</p>	<p>Extant</p>	
<p>MAG HQS/Photo Lab/Academic Classroom Building 301</p>	<p>1941</p>	<p>Former Squadron Offices and Storage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Part of the 1939 initial proposed base layout. Designed by the architectural firm of Albert Kahn.</p>	<p>Extant</p>	
<p>Aircraft Recovery Operations Ground Support Equipment Shop Building 620</p>	<p>1945</p>	<p>Last extant intact Quonset Hut on MCB Hawaii Kaneohe installation. Former Aircraft Engine Salvage Shop. Contributing resource to the Aviation District.</p>	<p>Extant</p>	
<p>Community Storage Buildings 708-712</p>	<p>1942</p>	<p>Underground Structures. Five former Fuse and Detonator Magazines. Contributing resources to the Aviation District.</p>	<p>Extant</p>	

Table 3-6 Summary of Existing Architectural Resources Within the APE

Name/Building #	Year Built	Evaluation of Significance	Status	Photo
Pali Kilo District				
Small Magazine and Inert Storehouses Buildings 701-707	1941	WWII-period earth-sheltered munitions magazines located along the roads throughout the Pali Kilo area. These are like the historic magazines 708–712 located within the NAS Kaneohe Aviation District.	Extant	
Flammables Storehouse Building 995	1942	Built as a splinter-proof paint locker, is a good example of this type of WWII construction. It is built of cast concrete, with an exterior of smoothly finished stucco. Individually NRHP eligible.	Extant	

Legend: MCB = Marine Corps Base; NAS = Naval Air Station; NHL = National Historic Landmark; NRHP = National Register of Historic Places; WWII = World War II.

3.4.2 Environmental Consequences

Potential impacts to cultural resources may result from (1) physically altering, damaging, or destroying all or part of a resource; (2) changing the character of the property’s use or physical features within the property’s setting that contribute to its historic significance; (3) introducing visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features; (4) neglecting the resource to the extent that it deteriorates or is destroyed; or (5) removing property from its historic location.

Under NEPA, the significance of an impact on cultural resources is based on the potentially affected environment and the degree of effects of the action. While a proposed action (the Section 106 proposed undertaking) could be determined under the NHPA Section 106 process to have an adverse effect on historic properties, that adverse effect under NHPA may not constitute a significant impact under NEPA. Measures implemented during the NHPA Section 106 process to avoid, minimize, or mitigate adverse effects to historic properties would reduce the degree of the effect of the action under NEPA.

Early in the planning process, MCB Hawaii determined that Alternative 1 is expected to affect cultural resources. MCB Hawaii initiated the NHPA Section 106 process in January 2022 and consultation is ongoing.

3.4.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and there would be no change to cultural resources.

3.4.2.2 Alternative 1

Project elements of Alternative 1 include the following activity types: demolishing existing buildings and structures, constructing new buildings and structures, renovating buildings, repaving, installing aircraft

tie-downs, adding fencing, installing underground utilities and fuel lines, and staging construction equipment.

Under NHPA Section 106, MCB Hawaii determined that implementation of Alternative 1 would result in adverse effects to historic properties including:

- Demolition of Hangar 103, one of five historic hangars. It is a contributing element of the Aviation District and individually eligible for listing in the NRHP.
- Demolition of Buildings 159, 160, 161, 183, and 184 which are small aircraft spares storage buildings located adjacent to Hangar 103 and are contributing elements of the Aviation District.
- Alteration, including possible removal or paving over of Bravo Ramp paved area bomb craters and strafing damage from the 7 December 1941 attack, and removal of historic paving elements, such as tie-downs. Bravo Ramp is a contributing element of the NHL and the Aviation District.

These proposed project activities also have the potential to diminish the integrity of the NAS Aviation District and the NAS Kaneohe NHL District. Project activities such as repaving, installation of tie-downs, fencing, utilities, storm water management features and fuel lines have the potential to disturb unidentified subsurface archaeological resources. In addition, the adverse effects associated with the implementation of Alternative 1 are expected to be lessened due to mitigation measures that are currently being developed as part of NHPA Section 106 consultation process. Alternative 1 would not affect the Mokapu House Lots Archaeological District.

The following sections analyze and describe effects on cultural resources by project activity type for archaeological and architectural resources.

Archaeological Resources

Demolition activities requiring ground disturbance have the potential to disturb or destroy subsurface archaeological resources, including known sites as well as those not yet identified (Allen, 2000; Walker et al., 2022; Gosser et al., 2002; Prishmont et al., 2001; Rechtman and Wolforth, 2000; Schilz and Allen, 1996). Buildings and structures proposed for demolition include Hangar 103; the small aircraft spares storage buildings (Buildings 159, 160, 161, 183, and 184) adjacent to Hangar 103; Buildings 4000 and 5068 to the east of the transient ramp; and Building 5069 to the east of Hangar 6886.

Ground disturbance associated with constructing new buildings (including supporting infrastructure) and demolition of existing structures could affect archaeological sites. The most substantial demolition proposed in Alternative 1 is that of Hangar 103. This activity, however, has minimal potential to encounter archaeological resources because the hangar is located on reclaimed land, approximately 20–30 meters offshore from the original coastline (Tomonari-Tuggle and Clark, 2021) (see Figure 3-6). While the potential for disturbance to intact archaeological resources or 3-31ecurens in this fill land is low, redeposited and disturbed cultural materials (including *iwi3-31ecurea*) may still be encountered.

The propeller maintenance facility would be located adjacent to the recently constructed Hangar 6886. During construction and excavation of that building, no archaeological resources were discovered, evidencing that additional discoveries are unlikely.

Proposed construction of the KC-130J Aircraft Direct Refueling System would involve ground disturbance to install fuel lines and storm water retention and drainage systems. The extent and depth of the disturbance related to this construction has not been defined, and the activity is in an area that is not fill

or reclaimed land. Therefore, there is a potential to disturb unidentified subsurface archaeological resources.

For all such construction activities, should construction activities encounter unknown subsurface archaeological resources, the contractor would immediately cease activities and notify base personnel, who would proceed pursuant to the NAGPRA and applicable Standard Operating Procedures described in the 2021 MCB Hawaii ICRMP (see Section 3.4.2.2).

Effects on archaeological resources are not anticipated from installation of GDTs because they consist solely of a trailer and antenna with stabilizing cables tied to surface-mounted blocks which do not require any ground disturbance. This would not affect subsurface archaeological sites such as those on or near Keawanui Hill (Sites 0365, 4619, 4620, and 4622) or adjacent to Hangar 105 (Site 4453). Aboveground archaeological features on Keawanui Hill, including upright and pavement stones and rock and coral piles, are outside the area proposed for the GDT and would not be affected. No other project elements besides the GDT location are proposed within the Mokapu House Lots Archaeological District.

Interior renovations of Hangar 102 would have no effects on known or not-yet-identified archaeological sites because the proposed renovations do not include ground disturbance.

Repaving activities are expected to involve replacement of existing material in some areas with new, stronger paving material with a thicker base that would extend below the current paving depth. However, the anticipated depth of ground disturbance for repaving would not exceed 18 inches below the existing ground surface within existing coral fill layers. In addition, Bravo Ramp is in an area of fill that was previously disturbed during initial construction in the 1920s and 1940s, so the potential for discovery of archaeological resources is low. Unlike repaving, restriping paved surfaces on Charlie Ramp and Bravo Ramp would not include ground disturbance and would have no potential to disturb archaeological resources.

Installation of tie-downs at Bravo Ramp near Hangar 105 may affect archaeological resources due to the construction footprint's proximity to the known NRHP-eligible archaeological site 4453. However, all previous documentation indicates site 4453 lies under coral fill layers extending more than 3 feet below the surface (Walker et al., 2022), and the anticipated depth of ground disturbance for installation of tie-downs would not exceed 18 inches. Ground disturbance in or above the coral fill layers is not anticipated to affect the known archaeological site or the layer where unidentified archaeological deposits are most likely to occur. Therefore, this project element has minimal potential for damage to known or unidentified archaeological sites.

The addition of security fencing on the north side of Runway 04/22, southeast of Charlie Ramp, and east of Transient Ramp would result in minimal ground disturbance due to post hole excavation. This activity is unlikely to disturb subsurface archaeological resources due to the small size and shallow depth of the disturbance area for fencepost installation.

Temporary construction laydown areas are proposed for Crescent Circle. This short-term activity does not include ground disturbance. No known archaeological sites are located at Crescent Circle.

Under Alternative 1, MCB Hawaii Kaneohe Bay aircraft operations would not affect archaeological resources.

For the reasons identified above, the likelihood of discovering previously unknown archaeological deposits in the APE is low. However, should such deposits be encountered, the ICRMP and the requirements of NAGPRA identify appropriate processes for managing such discoveries. The low

probability of discovery coupled with base processes for managing inadvertent discoveries would result in Alternative 1 having less than significant impacts to archaeological resources.

Architectural Resources

Construction activities that may affect historic architectural resources include demolition of existing buildings and structures and construction of new buildings and structures. Demolition of individually NRHP-eligible buildings and structures, or those that contribute to a historic district, would be an adverse effect.

Demolition of non-historic buildings would also occur but would not affect architectural resources. These include Buildings 4000 and 5068, which would be demolished to accommodate the proposed KC-130J Aircraft Direct Refueling System construction, and Building 5069, which would be replaced by a wash rack east of Hangar 6886.

Installing tie-downs and adding pavement striping west of Hangar 105 would not result in an adverse effect on architectural resources. The paved area is associated with the significant historic use of the Aviation District and helps define the spatial relationships of its contributing resources, but the addition of striping and tie-downs would not alter this. The addition of new security fencing, which would be similar to and continue the alignments of existing security fencing, would not affect historic architectural resources. Temporary construction staging and laydown would not affect architectural resources. The area proposed for this temporary activity, Crescent Circle, is outside of historic district boundaries and is not on or adjacent to the NHL or the Aviation District.

Alternative 1 includes interior renovations to Hangar 102 and non-historic Hangar 6886. While building renovations could alter the character of a historic building, the proposed alterations to Hangar 102 would follow Secretary of the Interior standards for rehabilitation, would only affect the interior, and would support adaptive reuse of the historic hangar. Therefore, the proposed renovations at Hangar 102 would not have an adverse effect on architectural resources.

Activities on Bravo Ramp have the potential to remove or alter character-defining features as Bravo Ramp is a contributing resource of the NAS Kaneohe NHL District. The repaving design may affect some bomb and strafing damage from the 7 December 1941 Japanese attack, and historic aircraft tie-downs and other hardware. The adverse effect on architectural resources would be reduced through proposed mitigation measures that includes documentation of the affected Bravo Ramp features.

Demolition of Hangar 103 and three ancillary storage buildings (Buildings 159, 160, 161, 183, and 184) would result in an adverse effect to these individually NRHP-eligible architectural resources and to the Aviation District to which they contribute. Effects to the Aviation District would be reduced by the proposed design review which is part of the MOA.

In summary, Alternative 1 would result in an adverse effect on individually NRHP-eligible architectural resources, the Aviation District, and the NAS Kaneohe NHL District. The proposed undertaking, including changes to the Aviation District, would allow for continued effective use of MCB Hawaii Kaneohe Bay as an operational military airfield while still retaining an association with its significant historic use. With implementation of mitigation measures developed through the NHPA Section 106 process and resulting MOA, Alternative 1 would not result in significant impacts to architectural resources.

Proposed Mitigation Measures

The following potential minimization and mitigation measures are under consideration for inclusion in the MOA for the proposed action, with final mitigation measures determined through the NHPA Section 106 and Section 110 consultation.

- Prepare and implement a plan for professional archaeological monitoring of ground disturbing activities associated with the Undertaking. Discoveries would be treated in accordance with 36 CFR § 800.13 and the NAGPRA Implementing Regulations at 43 CFR Part 10, as applicable.
- Conduct a study of the character defining features of Bravo Ramp including strafing marks, bomb craters, and ancillary features. The survey would precisely map these character-defining features along with providing historic context.
- Develop a digital Story Map on the Aviation Historic District and the Kaneohe NAS NHL District.
- Develop review process for the design of the new Hangar 103. Require the Hangar 103 design team to include a qualified historic architect to consider design qualities to minimize the effects of new construction.
- Provide consulting parties with the existing Pless Hall (B212) Reutilization Study and develop an updated Pless Hall (B212) Reutilization Study based on consulting party review and comments.
- Develop public outreach plan for tours of the Aviation Historic District and the Kaneohe NAS NHL District. The plan would develop a pilot program to provide two public tours per year over a 2-year period, after which the plan would be evaluated.
- Coordinate review of mitigation (Stipulation III.B.1-4) with the consulting parties, including circulating draft submittals to consulting parties for review (consulting parties would have forty-five [45] calendar days from receipt of the draft submittal to review and provide comment to MCB Hawaii Kaneohe Bay), considering input received from the consulting parties within said time period in the development of the final products, and distributing final products to consulting parties in digital form.
- Present the conceptual and 35% design to consulting parties to support consideration of measures to minimize adverse effects.
- Ensure any alterations in the agreed upon design that affect historic properties be reviewed by the project's historic architect for consistency with the agreed upon design.

3.5 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and their habitats. This analysis focuses on species that are important to the function of ecosystems or are protected under federal or state law at MCB Hawaii Kaneohe Bay. Habitat is defined as the resources and conditions present in an area that support a plant or animal. Biological resources are divided into the following categories: *Vegetation*, *Wildlife*, and *Special-Status Species*.

- *Vegetation* includes plant associations and dominant constituent species that are known or potentially occurring in the project area and region of influence. Potential “stressors” (i.e., potential project-related effects) to existing vegetation on MCB Hawaii Kaneohe Bay may be caused by direct and indirect sources, such as construction-related removal of vegetation, disturbance to vegetation, and indirect effects such as changes to storm water volumes and pollutant loads.
- *Wildlife* includes the characteristic animal species that are known or potentially occurring in the project area and region of influence. Special consideration is given to bird species protected under the Migratory Bird Treaty Act (MBTA) and Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Potential stressors to wildlife may include those described above for vegetation (direct disturbance, vegetation removal, and impacts to habitat through increased storm water volumes), lighting related to construction and operations, nesting/breeding season disturbance, potential bird-aircraft strikes, new personnel using natural resources and recreational areas on the installation, and changes in the noise environment during operations.
- *Special-Status Species* are defined in this EA as species that are listed, have been proposed for listing, or are candidates for listing as threatened or endangered under the federal ESA and other species of concern as recognized by state or federal agencies. Stressors for special-status species are similar to those described above for vegetation and wildlife but can vary by species (see impact analysis for Special-Status Species later in this section).

The region of influence for biological resources includes the project area as well as the regions near the project area boundaries that may experience noise, visual, other physical, or indirect impacts. The region of influence for vegetation consists of only the project area since direct and indirect effects would be limited to that area. The region of influence for wildlife is larger because of the noise footprint associated with current and proposed aircraft operations.

Two marine species are addressed in the analysis for potential indirect impacts while they are on shore: the Hawaiian monk seal (*‘ilioholoikauaua*, *Neomonachus schauinslandi*) and green sea turtle (honu, *Chelonia mydas*). These species occasionally haul out on the beaches of MCB Hawaii Kaneohe Bay. As described in Section 3.1.3.2, the change in operational noise over marine waters of Kaneohe Bay would be minimal (2–3 dB), so the minor increase in over-water acreage for any potential noise impacts to marine species would be less than significant and would cause no effect to listed marine species while in water (see Section 3.5.2.3). In addition, proposed activities occurring near the shoreline would consist of demolition, renovation, and construction on impervious surfaces, and, as such, be subject to the permit and conservation measures discussed in Section 3.3, *Water Resources*, minimizing the potential for any water runoff into Kaneohe Bay. For these reasons, potential impacts to in-water marine species (except for Hawaiian monk seal and green sea turtle discussed in Section 3.5.2.3) are not further analyzed in this EA.

3.5.1 Affected Environment

Figure 3-8 shows general biological resources features in the project area and region of influence. The following describes the existing conditions for the three categories of biological resources at MCB Hawaii Kaneohe Bay.

3.5.1.1 Vegetation

The project area and region of influence consists entirely of built or modified landscape with no notable ecological communities on or adjacent to the construction sites. Historically, the project area was cleared with heavy equipment and lacks native vegetation cover. Within the region of influence, there are a few scattered native species on the beach such as naupaka (*Scaevola taccada*). Landscaping within the project area and region of influence consists of non-native trees, shrubs, and grasses that are irrigated and maintained. There are no known natural occurrences of plants pending or listed as threatened or endangered under the ESA within the project area or region of influence. The existing non-native vegetation consists of planted landscape material (typically Bermuda grass and a variety of native and non-native planted trees and shrubs), non-native koa haole (*Leucaena leucocephala*), kiawe (*Prosopis pallida*), and Guinea grass (*Megathyrsus maximus*) shrubland. Low manicured turf grass typically grows between the runway and taxiway as well as in areas around the airfield. No wetlands are located within the project area.

3.5.1.2 Wildlife

Wildlife found in the project area consists of mammalian and bird species consistent with those found in a developed and urbanized environment.

Mammalian Species. Mammalian species in the project area consist of invasive species that are a constant concern at MCB Hawaii Kaneohe Bay including domestic/feral cats (*Felis catus*), rats (*Rattus* spp.), and mongoose (*Herpestes javanicus*).

MBTA-listed Bird Species. Nearly all migratory and resident birds present in the Hawaiian Islands, and all resident seabirds, are protected under the MBTA. Of the seabirds and migratory species, the migratory Pacific golden plover (kolea, *Pluvialis fulva*) utilizes the project area (in grassy regions), as well as the bulwer's petrel ('ou, *Bulweria bulwerii*) which nest in adjacent rocky shorelines. The ruddy turnstone ('akekeke, *Arenaria interpres*) is a shorebird found mainly in wetland areas, but it has been observed on the airfield in the project area. The indigenous wedge-tailed shearwater ('ua'u kani, *Puffinus pacificus chlororhynchus*) and great frigatebird ('iwa, *Fregata minor*) are not known to utilize the project area; however, they have been recorded flying through the area.

Certain MBTA-listed bird species in the airfield portion of the region of influence regularly require management in partnership with the U.S. Department of Agriculture (USDA) Wildlife Services due to pervasive populations. These species include the cattle egret (*Bubulcus ibis*), barn owl (*Tyto alba*), northern red cardinal (*Cardinalis cardinalis*), and house finch (*Carpodacus mexicanus*). Occasionally, these birds attempt to nest within or around the facilities at the project area. Non-ESA listed MBTA birds with the potential to occur in the region of influence are listed in Table 3-7 and are identified by their common name, Hawaiian name, and origin (native or introduced).

Document Path: G:\Project - 023019 MCBH Homebasing EA\02-Maps\Figures with Titles\Figure 3-8. Natural Resources at MCB Hawaii Kaneohe Bay.mxd

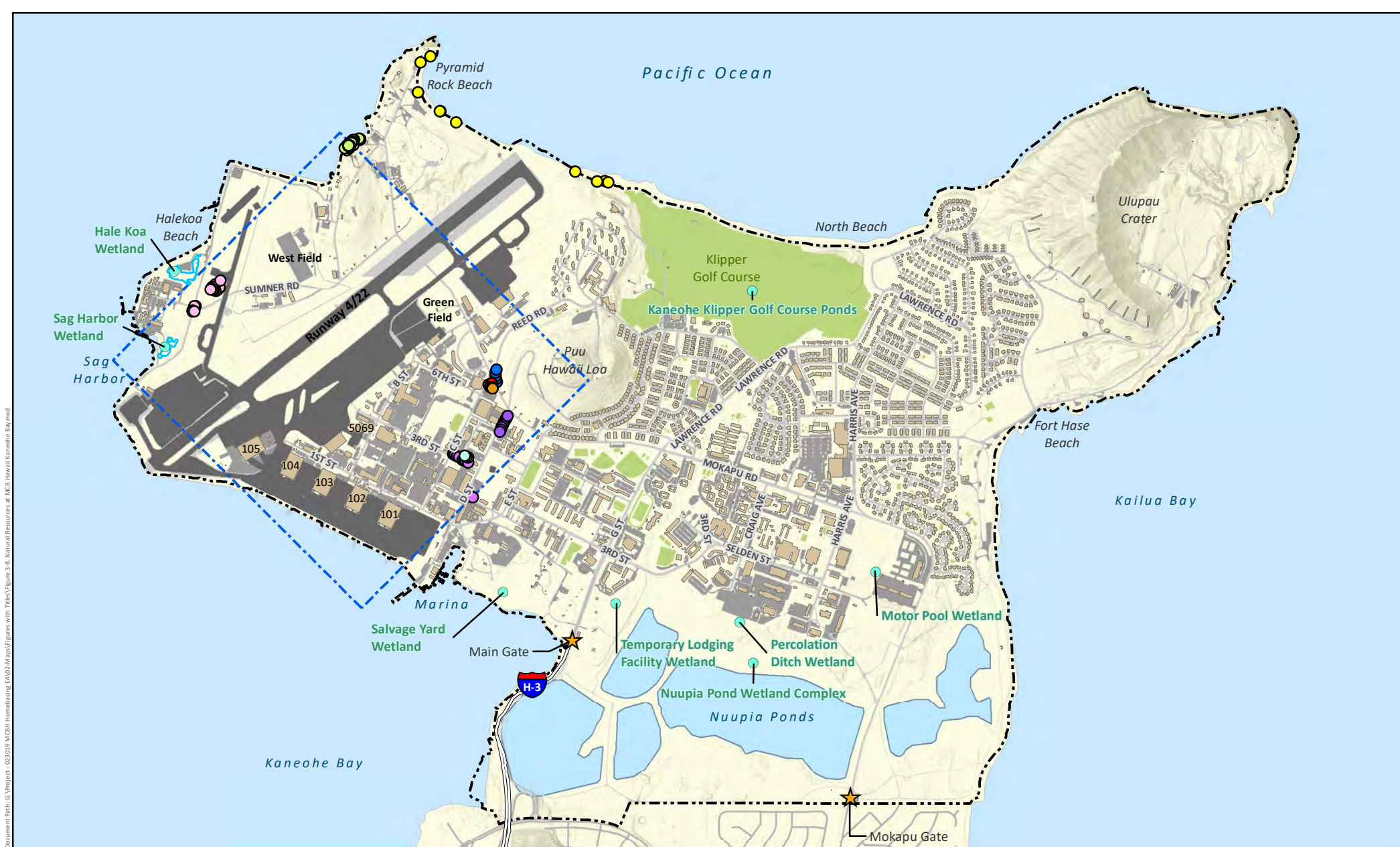
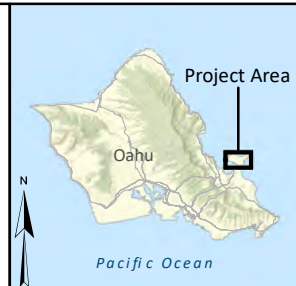


Figure 3-8. Natural Resources at MCB Hawaii Kaneohe Bay

<ul style="list-style-type: none"> MCB Hawaii Kaneohe Bay Boundary Gate Interstate Road 0 1,000 2,000 Feet 	<ul style="list-style-type: none"> Airfield Pavement/Apron Airfield Road Building Nesting Area for Hawaiian Birds Parking Area Recreation Area 	<ul style="list-style-type: none"> Wetland Point Vegetation Observations Blue jacaranda tree (<i>Jacaranda mimosifolia</i>) Fountain grass (<i>Pennisetum setaceum</i>) Hao (<i>Rauvolfia sandwicensis</i>) Koa oha (dwarf koa, <i>Acacia koaia</i>) Maiapilo (caper bush, <i>Capparis sandwichiana</i>) 	<ul style="list-style-type: none"> Milo (portia tree, <i>Thespesia populnea</i>) Ohe (<i>Reynoldsia sandwicensis</i>) Pua keni keni (perfume flower tree, <i>Fagraea berteriana</i>) Wildlife Observations Nalo meli maoli (Hawaiian yellow-faced bee, <i>Hylaeus anthracinus</i>) Proposed Action Approximate Project Location
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Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

Table 3-7 Non-ESA Listed MBTA Species Known to Occur or with Potential to Occur in the Region of Influence

<i>Scientific Name</i>	<i>Common Name</i>	<i>Hawaiian Name</i>	<i>Origin</i>
<i>Anas platyrhynchos</i>	Mallard	-	Introduced
<i>Anas wyvilliana</i>	Hawaiian duck-mallard hybrid	Koloa moali	Native
<i>Bubulcus ibis</i>	Cattle egret	-	Introduced
<i>Fregata minor palmerstoni</i>	Great frigatebird	‘Iwa	Native
<i>Puffinus pacificus chlororhynchus</i>	Wedge-tailed shearwater	‘Ua‘u kani	Native
<i>Phoebastria immutabilis</i>	Laysan albatross	Mōlī	Native
<i>Bulweria bulwerii</i>	Bulwer’s petrel	‘Ou	Native
<i>Arenaria interpres</i>	Ruddy turnstone	‘Akekeke	Native
<i>Sula sula rubripes</i>	Red-footed booby	‘Ā	Native
<i>Sula leucogaster</i>	Brown booby	‘Ā	Native
<i>Anous minutus</i>	Black noddy	Noio	Native
<i>Onychoprion fuscatus</i>	Sooty tern	Ewa ewa	Native
<i>Onychoprion lunatus</i>	Grey-backed tern	Pakalakala	Native
<i>Phaethon lepturus</i>	White-tailed tropicbird	Koa‘e kea	Native
<i>Tyto alba</i>	Common barn owl	-	Introduced
<i>Cardinalis cardinalis</i>	Northern red cardinal	-	Introduced
<i>Carpodacus mexicanus</i>	House finch	-	Introduced
<i>Pluvialis fulva</i>	Pacific golden plover	Kolea	Native

Non MBTA-listed Bird Species. Birds found in the project area and region of influence that are not protected under the MBTA include the common myna (*Acridotheres tristis*), zebra dove (*Geopilia striata*), rock pigeon (*Columba livia*), red-crested cardinal (*Paroaria coronata*), spotted dove (*Streptopelia chinensis*), red-vented bulbul (*Pycnonotus cafer*), chestnut munia (*Lonchura atricapilla*), and gray francolin (*Francolinus pondicerianus*).

Wetlands Bird Species. Wetlands, including mudflats, shallow ponds, estuarine and coastal wetlands exist within the region of influence and provide some habitat for waterbirds (see Figure 3-4), including the mallard (*Anas platyrhynchos*) and Hawaiian duck-mallard hybrid (*Anas wyvilliana*). The mallard and Hawaiian duck-mallard hybrids are frequently observed within the project area, particularly when ponding occurs on developed surfaces.

Seabirds. Although not reported within the project area, several additional species of seabirds are known to occur at MCB Hawaii Kaneohe Bay and may occur in the region of influence, such as the permanent colony of red-footed booby (‘ā, *Sula sula rubripes*) in the Ulupau Head WMA on the base range training facility approximately 2.5 miles away from the project area. Other common seabird species known from Kaneohe Bay and the surrounding waters and islets include the Laysan albatross (mōlī, *Phoebastria immutabilis*), brown booby (‘a, *Sula leucogaster*), black noddy (noio, *Anous minutus*), sooty tern (ewa, *Onychoprion fuscatus*), grey-backed tern (pakalakala, *Onychoprion lunatus*), and white-tailed tropicbird (koa‘e kea, *Phaethon lepturus*), which may overfly the project area on occasional, seasonal, or temporal basis.

3.5.1.3 Special-status Species – Federal

ESA-listed species with the potential to occur in the region of influence are listed in Table 3-8 and are identified by their common name, Hawaiian name, and regulatory status.

Table 3-8 Special-Status Species Known to Occur or with Potential to Occur in the Project Area and Region of Influence

<i>Scientific Name</i>	<i>Common Name</i>	<i>Hawaiian Name</i>	<i>Regulatory Status</i>
Birds			
<i>Anas wyvilliana</i>	Hawaiian duck	Koloa moali	FE, SE
<i>Fulica alai</i>	Hawaiian coot	‘Alae ke‘oke‘o	FE, SE
<i>Gallinula galeata sandvicensis</i>	Hawaiian gallinule	‘Alae ‘ula	FE, SE
<i>Himantopus mexicanus knudseni</i>	Hawaiian stilt	‘Ae‘o	FE, SE
<i>Oceanodroma castro</i>	Band-rumped storm-petrel	‘Akē ‘Akē	FE, SE
<i>Pterodroma sandwichensis</i>	Hawaiian petrel	‘Ua‘u	FE, SE
<i>Puffinus auricularis newelli</i>	Newell’s shearwater	‘A‘o	FT, ST
<i>Asio flammeus sandwichensis</i>	Hawaiian short-eared owl	Pueo	SE
Terrestrial Mammals			
<i>Lasiurus cinereus semotus</i>	Hawaiian hoary bat	‘Ōpe‘ape‘a	FE, SE
Arthropods			
<i>Danaus plexippus</i>	Monarch butterfly	-	C
<i>Hylaeus anthracinus</i>	Anthricinan yellow-faced bee, Hawaiian yellow-faced bee	Nalo meli maoli	FE, SE
Marine Mammals			
<i>Neomonachus schauinslandi</i>	Hawaiian monk seal	‘Ilioholoikauaua	FE, SE
Marine Reptiles			
<i>Chelonia mydas</i>	Green sea turtle	Honu	FT, ST

Notes: Selections for Listing Status Column include: C = candidate species for federal ESA listing, FE = federal endangered, SE = state endangered, FT = federally threatened, ST = state threatened.

Wetlands Bird. Wetlands in the region of influence provide potential habitat for ESA-listed waterbirds. These waterbirds include the endangered Hawaiian stilt (‘ae‘o, *Himantopus mexicanus knudseni*), endangered Hawaiian duck (koloa moali, *Anas wyvilliana*), endangered Hawaiian gallinule (‘alae ‘ula, *Gallinula galeata sandvicensis*), and endangered Hawaiian coot (‘alae ke‘oke‘o, *Fulica alai*). Due to the proximity of wetlands, the Hawaiian stilt and Hawaiian duck have been observed in the project area, particularly when ponding occurs on developed surfaces. The Hawaiian coot and Hawaiian gallinule occur in wetlands at MCB Hawaii Kaneohe Bay, primarily at the freshwater influenced portions of the Nuupia Ponds (MCB Hawaii, 2017); however, they are also known to occur within the region of influence at Sag Harbor wetland (Navy, MCB Hawaii, 2021).

Hawaiian stilts and Hawaiian ducks can be found along shoreline, estuarine, and freshwater habitats. The Hawaiian stilt breeding season normally occurs from mid-February through late August, with peak nesting occurring from May to July. Nests are shallow depressions lined with stones, twigs, and debris in mudflats (USFWS, 2011). The Hawaiian duck was common in the 19th century, but populations are now largely reduced (Center for Biological Diversity, 2022). The Hawaiian duck has largely been replaced with a hybrid between the Hawaiian duck and mallard on Oahu (USFWS, 2011). The Hawaiian coot populations at MCB Hawaii Kaneohe Bay have increased in recent decades (250+ documented annually since 2018) with activity observed primarily at the Nuupia Ponds. Hawaiian coot are no longer commonly seen at the Percolation Ditch Wetland or Klipper Golf Course Ponds (Navy, MCB Hawaii, 2021). An average of 20 Hawaiian gallinules have been documented annually at the Nuupia Ponds and have also been observed at the Percolation Ditch Wetland, Klipper Golf Course Ponds, and Sag Harbor Wetland. Hawaiian coots nest primarily in fresh or slightly brackish shallow water with robust wetland plants, while Hawaiian gallinules construct floating nests in freshwater with dense vegetation.

There is suitable foraging and nesting habitat for Hawaiian duck and Hawaiian stilt within the project area and region of influence. Infrequently, individuals attempt to nest within or around the facilities in the project area. To reduce the hazards of bird strikes, MCB Hawaii Kaneohe Bay has a Biological Opinion from USFWS that authorizes hazing of ESA-listed species from the airfield (USFWS, 2020). USDA Wildlife Services personnel use pyrotechnics, propane cannons, hand clapping, air horns, train horns, rattles, cattle flags, firearms, and vehicles to disperse wildlife from critical areas of the airfield as part of the installation's Bird/Wildlife Aircraft Strike Hazard (BASH) Plan (Marine Corps, 2011). Hazing of Hawaiian ducks and Hawaiian stilts on and near the airfield reduces the potential hazard to aircraft in the project area and reduces the likelihood of injury and/or mortality to ESA-listed birds. For instance, between January and October 2021, 153 Hawaiian stilts and 126 Hawaiian ducks were intentionally dispersed from MCBH Kaneohe Bay with no reported aircraft strikes to either of these species (USDA, 2021). Programs implemented under the Integrated Natural Resources Management Plan (INRMP) (MCB Hawaii, 2017) and the BASH Plan are currently in place to protect and monitor ESA- and MBTA-listed species (see Section 3.6, *Public Health and Safety*).

Seabirds. Of the ESA-listed seabirds that have the potential to occur, the endangered band-rumped storm petrel ('akē 'akē, *Oceanodroma castro*) has not been observed in the project area; however, its call has been heard on base around Ulupau crater, which is on the northeast side of the installation and outside of the region of influence. The endangered Hawaiian petrel ('ua'u, *Pterodroma sandwichensis*) and the threatened Newell's shearwater ('a'o, *Puffinus auricularis newelli*) have been detected by sound meter surveys around the Ko'olau range; however, they have not been detected or observed in the project area or region of influence (or anywhere on MCAS Kaneohe Bay).

Hawaiian Hoary Bat. The endangered Hawaiian hoary bat ('ōpe'ape'a, *Lasiurus cinereus semotus*) is present in the region of influence, but it has not been documented within the project area. The base was recently surveyed for the endangered Hawaiian hoary bat using an acoustic sound recorder (Pinzari et al., 2021). Four bat monitoring stations surrounding the project area did not detect any bats during a recent 2-year survey. While areas of the region of influence along the northwestern and northeastern sides of the runway have substantial tree cover that may be utilized by the Hawaiian hoary bat, and bats prefer to forage where such wooded areas and open areas come together, only a transitory presence has been identified in the region of influence.

Monarch Butterfly. The monarch butterfly (*Danaus plexippus*) is currently a candidate for federal listing and is seen in the project area and region of influence in search of desired vegetation such as the crown flower (*Calotropis gigantea*). Because there is no crown flower planted within the project area or region of influence, the monarch butterfly has only transited through the area and has not been observed foraging or utilizing vegetation within the region of influence.

Hawaiian Yellow-faced Bee. The Hawaiian yellow-faced bee (nalo meli maoli, *Hylaeus anthracinus*) is known to occur in coastal regions of Oahu in narrow rocky corridors along the shoreline (Magnacca and King, 2013). The largest populations of this species on Oahu have been documented on the coast north of the airfield but outside the project area and region of influence (Magnacca, 2017). The Hawaiian yellow-faced bee is not known to occur in the project area or region of influence.

Hawaiian Monk Seal. Hawaiian monk seals occasionally come to shore (haul-out) on the beaches within the region of influence at MCB Hawaii Kaneohe Bay. An average of 45 seals per year hauled out on the beaches between 2017 and 2021 (MCB Hawaii, 2017). This can occur at any of the beaches on base. Approximately 30–60 monk seal sightings annually are reported to MCB Hawaii Environmental Compliance and Protection Division (MCB Hawaii, 2021).

Green Sea Turtle. Green sea turtles also occasionally haul-out on the beaches within the region of influence at MCB Hawaii Kaneohe Bay. Nesting has been documented along the Fort Hase and North Beach shorelines (MCB Hawaii, 2022b). Approximately 7–30 green sea turtle sightings annually are reported to MCB Hawaii Environmental Compliance and Protection Division (MCB Hawaii, 2021).

3.5.1.4 Special-status Species – State

The land-dwelling Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) is state-listed endangered and has been documented near the project area and in the region of influence at MCB Hawaii Kaneohe Bay. The vegetation around the airfield provides suitable nesting habitat for this ground-nesting raptor, and it has been observed traversing, roosting, and foraging within and near the project area (MCB Hawaii, 2017; Price Lab, 2022). No nests are documented in the region of influence; the only ones documented on base are near Nuupia pond (L. Bookless, personal communication, 13 July 2022).

3.5.2 Environmental Consequences

3.5.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no impact to biological resources.

3.5.2.2 Alternative 1

Vegetation

Potential impacts to vegetation are described for construction and operational activities. Approximately 4.25 acres of landscaped vegetation would be cleared and developed. Vegetated portions of the project area consist of mostly planted landscape material; no notable ecological communities occur on or adjacent to the construction sites. Site preparation and construction activities would involve the clearing of non-native shrubs and grasses. Operational activities would include vegetation maintenance. Vegetation restoration would include ground preparation, planting, temporary irrigation, and maintenance. Restored turf grass vegetation would be installed over a bio-degradable erosion-control

fabric and would incorporate at least 50% native plant species. To prevent manmade erosion over time, Alternative 1 also includes landscape treatment consisting of planting, protective fencing, and walkways. The project design features in Table 2-5 (such as bioretention, vegetated swales, underground chambers, and pervious pavement) would be implemented to manage storm water volumes and avoid any potential flooding or ponding at and near the project area. Therefore, there would be minimal change to the type and volume of water affecting vegetation in the project area. Proposed native plant vegetation restoration and landscape repair would result in minor beneficial impacts to vegetation in the project area. There would be no vegetative impacts to the region of influence. For these reasons, Alternative 1 would have less than significant impacts to vegetation.

Wildlife

Potential impacts to wildlife are described for construction and operational activities. The impacts identified for birds may apply to all species present. Unique impacts specific to an individual species or group of birds are further detailed where necessary.

Construction

Habitat. Approximately 4.25 acres of disturbed, manicured/landscaped vegetation would be cleared and developed into impervious ground cover or facilities. The proposed new impervious surfaces impact only landscaped areas that provide minimal habitat for ground-nesting and foraging bird species. There are no shrubs or trees in this area that provide suitable habitat for wildlife. In addition, interior portions of the hangars would be designed with netting or slanted surfaces to keep birds from nesting in the hangar. Impacts to mammalian species would be minimal as domestic/feral cats, rats, and mongoose are mobile and would leave the immediate area of construction and can find habitat elsewhere on the installation. Therefore, Alternative 1 construction would have less than significant construction impacts to bird and other wildlife habitat.

Water. Standing water attracts birds such as waterbirds and cattle egrets. To minimize this attraction, construction activities would be managed to avoid creating temporary ponding in the project area, including covering storm water detention basins. With regards to water quality, construction activities would comply with NPDES permit requirements under the existing Storm Water Management Plan thereby minimizing impacts to water quality in the region of influence. In addition, conservation measures identified in Section 2.3 such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins (see Table 2-5 for complete water-related conservation measures) would be required to further minimize impacts. Given the absence of new water attractions and preservation of existing water resources and water quality during construction, Alternative 1 construction would have less than significant impacts to water resources used by birds and other wildlife.

Fallout. Seabird fallout can occur when unnatural lighting at night attracts and disorients birds to areas that may place them in dangerous conditions leading to their injury or death, as well as increased risk for potential bird-aircraft strikes. For example, in the project area, every year during fledging (September 15 through December 15), wedge-tailed shearwaters and bulwer's petrels require rescuing because of being impacted by light from aircraft hangars (USDA, 2021; L. Bookless, personal communication, 2 June 2022). Many bird species are attracted to facilities with lights, so lighting use during nighttime construction is a potential stressor to nocturnal or light sensitive seabird species. To minimize this potential impact, construction is proposed only for daytime hours. If limited unplanned nighttime construction must occur, or lighting is required for safety during non-construction hours, all

exterior lights would meet or exceed USFWS, National Oceanic and Atmospheric Administration (NOAA), and/or International Dark-Sky Association (IDA) standards for the type of work to be undertaken. Additional conservation measures to further reduce risk of fallout (see Table 2-5) include use of tinted windows, elimination of lighting on the top of the buildings, relocating lights as close to the ground as possible, use of solid hangar doors that do not allow any interior light to pass through, and closing doors when activity is not in progress. In addition, all on-site contractors would be briefed on how to conduct construction in the presence of light-sensitive bird species (L. Bookless, personal communications, 6 March 2022). With implementation of these measures to reduce lighting impacts, Alternative 1 construction would have less than significant impacts to birds due to fallout.

Strike. There is a very slight risk of injury or death to birds due to vehicle or equipment collisions during construction. The base has bird hazing protocols at the airfield/project area that are approved by USFWS to reduce the possibility of impact, and these would continue under Alternative 1. In addition, conservation measures described above to prevent temporary ponding and excess lighting would minimize attraction of birds to the construction area. Collectively, these measures would result in the construction having less than significant impacts to birds due to vehicle or equipment collisions.

Noise. Construction noise would result in temporary impacts to birds and other wildlife. Multiple bird species (e.g., northern red cardinals and house finches) often occur within and around the hangars. Construction-related noise may temporarily displace such wildlife from habitat in the immediate vicinity of the project area. However, because construction would occur at previously developed and actively used areas where aircraft and machinery are in regular use around the airfield creating a noise environment consistent with a construction area, birds have either adapted to the general noise of the flightline and other construction areas or would temporarily relocate from the construction areas to adjacent similar habitats. Given the frequency of transient fighter aircraft operations, as well as frequent MV-22 operations on the flightline, any temporary construction noise impacts are unlikely to result in new or unique impacts. Considering the temporary nature of the construction impacts, its similarity to ongoing operational noise levels, and the high degree to which wildlife at MCB Hawaii Kaneohe Bay are already habituated to high levels of noise associated with current activities, Alternative 1 construction would have less than significant noise impacts to wildlife.

Operation Impacts

Habitat. Many non-listed and MBTA-listed birds are observed flying in the region of influence (e.g., cattle egret, Pacific golden plover) and some have been documented nesting within hangars (e.g., house finch). As described above, there are minimal changes to the habitat resulting from the proposed project's construction. With regards to operations, the two squadrons would occupy hangars and function in a similar manner to the existing aircraft at MCAS Kaneohe Bay operations. Consistent with current operations, interior portions of the new hangar would be designed with netting or slanted surfaces to keep birds from nesting in the hangar, and current hazing management efforts conducted in partnership with the USDA Wildlife Services would continue to deter birds from utilizing the airfield. The absence of any new or increased operational impact to habitat results in Alternative 1 operations having less than significant impacts to bird and other wildlife habitat.

Water. Possible operational impacts resulting from impacts to water are increased ponding of water on developed surfaces and contamination of water sources frequented by birds or mammalian species. With regards to ponding, applicable LID techniques such as vegetated swales established during construction would remain beyond the construction period (see Table 2-5 for complete water-related

conservation measures). In addition, the MCB Hawaii Environmental Compliance and Protection Division and USDA Wildlife Services personnel manage ponding issues via bird hazing if there is increased potential for bird-aircraft strikes. The two new squadrons would operate similarly and in similar locations and be similarly managed as existing aircraft. Regarding possible contamination of water resources used by birds, design features would capture and contain any potential spills from the wash rack and refueling operations to prevent water contamination. Additional LID features such as underground chambers and pervious pavement as LID for water management beyond the construction period (see Table 2-5) would be implemented to further minimize potential pollutants entering storm water flows. As a result of these existing and proposed measures, Alternative 1 operations would have less than significant impacts to water resources used by birds and mammalian species.

Fallout. Fallout could occur from operational lighting in the project area from hangar lights, interior lighting through windows, and exterior lighting. As noted above, the operation of the two new squadrons is consistent with existing operations at the airfield, and the base has comprehensive procedures to minimize the potential for fallout from aircraft operations. Equipment to reduce fallout include installation of down-shielded lights, tinted windows, and a full cut-off feature that minimizes backlight, uplight, and glare. This feature also includes automatic motion sensor switches and controls on all lights visible to the outdoors (see Table 2-5 for complete lighting conservation measures). Procedures such as closing doors when activity is not in progress and limiting use of lights during the seabird fledging period further reduce instances of fallout. Therefore, Alternative 1 operations would have less than significant fallout impacts to birds.

Strike. As with all airfields, there is a risk of strike to birds by aircraft. Certain bird species (e.g., cattle egret) are known to pose a potential hazard to aircraft in the project area and region of influence. MCB Hawaii Kaneohe Bay has a comprehensive BASH Plan and a corresponding Biological Opinion (USFWS, 2020) to minimize the potential for impacts to all bird species (see Section 3.6, *Public Health and Safety*). As noted previously, the two new squadrons would operate in a similar manner to current base aircraft. Annual bird count data finds that migratory birds returning to the peninsula have adapted and are able to sustain populations among operations; however, new birds visiting the area do pose increased risk of strike and could cause temporary setbacks in overall bird counts (L. Bookless, personal communications, 21 June 2022). Conservation measures identified in prior sections would be implemented to reduce the potential to attract seabirds, such as wedge-tailed shearwaters, to the airfield. These conservation measures would also reduce the potential presence of birds and, therefore, minimize potential bird strike impacts associated with the proposed action. In accordance with existing permits, bird hazing would continue to be conducted regularly in partnership with the USDA Wildlife Services to discourage birds from the airfield where they may be at risk of strike. The proposed action would cause no appreciable change in the timing of daytime flights and flight patterns from current operations, where birds have adapted to airfield conditions. Since the two new squadrons would not introduce any new strike hazards and the base has comprehensive well-established procedures to minimize strike potential associated with aircraft operations, Alternative 1 operations would have less than significant impacts to birds in flight.

Noise. Aircraft operations, particularly low-level flights and landings/takeoffs have the potential to cause behavioral disturbance to wildlife due to noise. Studies have shown that birds can habituate to noise following frequent exposure and cease to respond behaviorally to the noise (Larkin et al., 1996; National Park Service, 1994; Plumpton, 2006). Wildlife at MCB Hawaii Kaneohe Bay have already habituated to high levels of aircraft noise and other operational noise associated with current activities in the project

area and region of influence, and the two new squadrons would operate in a manner similar to existing operations. In many cases, individuals exposed to noise would return to a stable equilibrium almost immediately after exposure (Navy, 2018). Natural resource staff conduct bird counts three times annually, and numbers are consistent from year to year. These data support the assumption that noise from operations have not resulted in population decline nor impacted breeding or nesting success of resident bird species on MCB Hawaii Kaneohe Bay. (L. Bookless, personal communications, 21 June 2022). Aircraft operations would be the dominant noise contributor under Alternative 1. Average noise levels would be similar to current aircraft activities (see Section 3.1).

The addition of the MQ-9 and KC-130J squadrons to MCB Hawaii Kaneohe Bay results in a slight expansion in the average noise contours throughout the region of influence when compared to existing conditions, most notably at the very north end of the airfield (see Figure 3-2). The proposed action would result in less area (approximately 11%) inside the 65 DNL contour than has been previously recorded in the 2016 AICUZ noise modeling (MCB Hawaii, 2016). The proposed area within the 75+ DNL contour lines, which includes the 80+ and 85+ DNL acreage, would collectively increase by 38 acres from existing conditions, representing less than a 2% increase; however, all of this would occur over water or on the flightline with minimal populations of wildlife as identified above. In areas of the region of influence that support greater populations of wildlife due to increased tree canopy, such as at Sag Harbor Wetland at the northwestern end of the airfield, the potential increase in area affected by noise (75 dB DNL and above) would be approximately 75 feet (see Figure 3-2). The sand dunes directly northwest of the airfield and on the flightline would see no greater than 250 feet of contour extension for the 75 DNL boundary. Wildlife species currently existing in the region of influence have been exposed to aircraft noise and are habituated to operational noise that currently occurs at MCB Hawaii Kaneohe Bay. Because the proposed aircraft operations would be similar to historical aircraft operations, and only a slight (2%) increase in areas of the flightline and open water affected by noise at 75 dB DNL is anticipated, Alternative 1 operations would have less than significant noise impacts to wildlife.

3.5.2.3 Special-status Species – Federal

There is no federally designated critical habitat for any ESA-listed species on, or close to, the project area. As identified in Table 2-5, all construction contractors and aircraft squadron personnel would participate in MCB Hawaii Kaneohe Bay's existing natural resources education program. This would minimize potential effects from personnel accessing other parts of the installation for recreation. A detailed analysis for each special-status species is described below.

Birds. ESA-listed birds would be subject to the same potential construction and operational impacts listed above for all birds including habitat, water, fallout, strike, and noise. No unique risk has been identified for ESA-listed bird species. Therefore, the impact analysis described above is equally applicable to ESA-listed waterbirds including the Hawaiian duck, Hawaiian coot, Hawaiian gallinule, and Hawaiian stilt; as well as ESA-listed seabirds including the band-rumped storm petrel, Newell's shearwater, and Hawaiian petrel (refer to species listed in Table 3-7). Natural resource staff conduct bird counts three times annually for endangered birds and have found that the number and types of ESA-listed birds are consistent from year to year, evidencing that operations have not resulted in population decline nor impacted breeding or nesting success. In addition, there has been ongoing construction on the airfield over the last several years with no observable population change (L. Bookless, personal communications, 21 June 2022). For

these reasons, Alternative 1 may affect, but is not likely to adversely affect, ESA-listed bird species, and there would be less than significant impacts to the species.

Hawaiian Hoary Bat. As discussed above, the project area is mostly developed. The proposed action would result in the conversion of 4.25 acres from landscaped to impervious surfaces, less than a 2% change from existing conditions. Few trees are currently located at that portion of the project area and tree and vegetation removal is not anticipated as part of site preparation due to the developed nature of the project area. There has been no recorded presence of the Hawaiian hoary bat within the project area. Given the absence of the species in the project area, the proposed action would not affect individual Hawaiian hoary bats. Sparsely occurring landscape trees are not suitable for Hawaiian hoary bats based on the lack of a closed canopy system, which Hawaiian hoary bats seek for protection from environmental factors (i.e., rain, wind, sun). If tree trimming/removal is required, it would be done outside of the hoary bat pupping season (1 June – 15 September).

With regards to the region of influence, bats are sensitive to noise; however, due to the current use of airspace, bats are already discouraged from use of the area (Voigt et al., 2018). As described above under “Noise,” there would be only a slight increase in average aircraft noise that would occur primarily over the existing flightline and nearshore water away from any potential bat habitat, and this would not be a noticeable change to the acoustic environment for any bats that might potentially be within the region of influence. Conservation measures detailed above for regulation of artificial lighting would further reduce potential impacts to bats, as well as those measures targeting sediment control to reduce negative impacts from airborne particles during construction. Alternative 1 would incorporate a design feature to avoid the addition of barbed wire fencing that could entangle foraging Hawaiian hoary bats. Conservation measures to avoid adverse impacts during the pupping season are further detailed in Table 2-5. Therefore, Alternative 1 would have no effect on the Hawaiian hoary bat, and there would be no significant impacts to the species.

Monarch Butterfly. There is no known presence of desired vegetation (i.e., crown flower) for the monarch butterfly in the project area or region of influence. The only known host plants are crown flower bushes planted at the MCB Hawaii Kaneohe Bay Environmental Compliance and Protection Division building on the north side of the runway near Mokapu Road. This location is approximately 770 feet away from the only component of the proposed project, the extendable antenna for the proposed GDT atop Keawanui Hill. The proposed projects proximity to host plants would not pose a threat to butterflies that would potentially use these host plants. . In addition, the species has only been observed traversing the region of influence to reach desired vegetation outside of the project area and region of influence. The risk of monarch butterfly strike would not be increased from current conditions, as the antenna placement would not require construction, nor would it increase the current level of traffic near the Environmental Compliance and Protection Division building. No suitable habitat, food source, or area of known utilization is expected to be disturbed or changed from existing conditions and, therefore, Alternative 1 would have no effect on the monarch butterfly.

Hawaiian Yellow-faced Bees. A large population of Hawaiian yellow-faced bees is known to exist in the coastal regions of the region of influence north of the project area, but this species has not been documented within the project area or region of influence. Some suitable habitat could potentially occur along vegetated sand dunes in coastal regions adjacent to the project area; however, no construction or new operations are planned along the shoreline that would affect potential habitat for the Hawaiian yellow-faced bees. Therefore, Alternative 1 would have no effect on the Hawaiian yellow-faced bee.

Hawaiian Monk Seal and Green Sea Turtle. Hawaiian monk seals and green sea turtles occasionally haul-out on the beaches at MCB Hawaii Kaneohe Bay. As described in Section 3.1.3.2, noise changes associated with proposed aircraft operations in the region of influence where monk seals and sea turtles can occur would be minimal. Though the change in noise contours include approximately 38 additional acres of surface area under the 75 dB DNL, most of this new area is over the runway and nearshore surface waters and represents less than a 2% increase in area over existing conditions. Although the number of overflights that would occur in this area could increase in a typical day or week, in-water species included in this area would not experience a change in type or magnitude of single-event noise levels at or below the surface of the water due to the MQ-9s and KC-130Js operational similarity to other propeller aircraft that use the airfield. Furthermore, exposure of a monk seal or sea turtle to aircraft presence and noise would last for only seconds as the aircraft quickly passes overhead. Aircraft takeoffs, landings, or overflights could potentially startle animals; however, these events only produce noise at any given location for a brief period as the aircraft climbs to cruising altitude and pass quickly overhead. Monk seals and sea turtles hauled out on beaches at MCB Hawaii Kaneohe Bay typically show no evidence of startle reaction or behavior changes during aircraft overflights (L. Bookless, personal communication, 7 July 2022), and it is uncommon for monk seals and sea turtles to be hauled out on the same location of a beach throughout the year, so repeated exposure to individuals over short periods (days) is unlikely. As a result, in the unlikely event monk seals or sea turtles encounter aircraft noise, behavioral reactions to aircraft overflight noise are likely to be brief, discountable, and insignificant and would not affect natural behaviors.

The proposed action would include an increase in military personnel and dependents from baseline conditions; however, as explained in Section 2.1.2, the proposed action represents a reduction of 165 personnel and dependents from historical base populations. Potential indirect impacts to monk seals and sea turtles could potentially occur from recreational use of beaches on the installation where these species occasionally haul out. Currently, the potential threats to this species due to disturbance from beach visitors are mitigated through existing education efforts, reporting requirements, and placement of temporary barriers to keep the public away from the individuals (MCB Hawaii, 2017). The MCB Hawaii Environmental Compliance and Protection Division would continue current education and signage procedures to minimize the potential for these types of interactions. Under the proposed action, all associated personnel and contractors would be required to complete a natural resources education program that details measures to protect ESA-listed species they may encounter (see conservation measures in Table 2-5). In addition, the MCB Hawaii INRMP (MCB Hawaii, 2017) requires that any incidents of basking/nesting sea turtles or hauled-out seals be reported to the NOAA hotline and the military police, barriers be erected and monitored around the animal, and that people and pets remain at least 50 feet away. Implementation of these current and proposed conservation measures would minimize the potential disturbance impacts from the public. Therefore, Alternative 1 is not likely to adversely affect the Hawaiian monk seal and green sea turtle, and there would be less than significant impacts to these species.

ESA Section 7

MCB Hawaii initiated informal consultation with USFWS, Pacific Islands Office under section 7 of the ESA for the proposed action's potential impacts to ESA-listed species (see Appendix C for correspondence). Species included in the informal consultation include the Hawaiian duck, Hawaiian coot, Hawaiian gallinule, Hawaiian stilt, band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, Hawaiian monk seal, and green sea turtle. MCB Hawaii determined that Alternative 1 would have no effect on the hoary bat, monarch butterfly, and Hawaiian yellow-faced bees and may affect, but is not likely to

adversely affect, other ESA-listed species. Consultation with USFWS is ongoing; following completion of consultation, the Final EA will be updated to include any additional analysis, effect determinations, and/or conservation measures that may arise from the consultation.

3.5.2.4 Special-status Species – State

There is suitable pueo foraging habitat in the project area. The project area is within the outer home range of pueos resident to Nuupia Pond, and the vegetated area adjacent and northwest of the airfield within the region of influence has been documented as territory where pueo occur (MCB Hawaii, 2017; Price Lab, 2022). To reduce risk to pueos in tall grasses, project construction and operational maintenance would adopt conservation measures that require halting any potentially harmful activity if nests, eggs, or chicks are observed. If adults/nests/chicks are found and/or flushed out during construction or operational activity, contractors must stop work and inform MCB Hawaii natural resources staff of the species presence (Price Lab, 2022). Noise effects to pueos within the region of influence are similar to those described above for birds. Therefore, Alternative 1 would have less than significant impacts to the species.

3.6 Public Health and Safety

Public health and safety considers whether the proposed action has the potential to affect the safety, well-being, or health of members of the public and MCB Hawaii Kaneohe Bay. Health and safety issues include impacts from aircraft noise (addressed in Section 3.1), potential groundwater effects (addressed in Section 3.3), aviation safety related to the operation of aircraft, and the potential for BASH.

3.6.1 Affected Environment

The region of influence is the project area within the boundaries of MCB Hawaii Kaneohe Bay and the airfield environment within which aircraft patterns, landings, and takeoffs would occur. MCB Hawaii Kaneohe Bay is a secure military installation with access limited to military personnel, civilian employees, contractors, and military families. The general public is allowed access only for specific public events; base access for non-public events requires either a background check or escorted access with an authorized sponsor.

Certain bird species are known to pose a potential hazard to aircraft in the project area. Programs implemented under the INRMP and the BASH Plan are currently in place to minimize the potential for strike hazards (Marine Corps, 2011). MCB Hawaii Flight Operations is responsible for clearing birds from the runways and taxi approaches. Additionally, birds are regularly hazed from the flightline area by USDA Wildlife Services staff, under permits from the USFWS (USFWS, 2020). Aircraft pilots are instructed to not fly over the islets (where birds have not adapted to such conditions) and the existing airfield office manager has documented this instruction within the BASH Plan to avoid unintended contact.

3.6.2 Environmental Consequences

3.6.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no change to public health and safety.

3.6.2.2 Alternative 1

MCB Hawaii Flight Operations would continue to implement the BASH Plan to minimize the potential for aircraft/bird strikes. Propeller aircraft similar to the MQ-9 and KC-130J aircraft regularly conduct operations at the airfield, so there would be no change in BASH procedures at the airfield. Current instructions to aircraft pilots would continue to apply to all aircraft using the airfield. Furthermore, timing of proposed flights and flight patterns would be similar to the existing operational use of the project area, where birds have adapted to airfield conditions. Therefore, the potential for bird/wildlife aircraft strikes under Alternative 1 would not have significant impacts to public health and safety.

The MQ-9 squadron unmanned aircraft are regulated by Federal Aviation Regulations Part 91 and operate in accordance with Naval aviation procedures. Launch and recovery of unmanned aircraft occurs from the military runway at MCB Hawaii Kaneohe Bay within designated accident potential zones located outside populated areas. Proposed aircraft operations for both the MQ-9 and KC-130J aircraft would be conducted in existing military operating and training areas, with no operations conducted over populated areas.

A Class A mishap is an accident that results in direct costs of \$2,000,000 or more, loss of aircraft, a fatality, or permanent total disability. Based on the most recent 10 years of data, average Class A mishap

rates for the MQ-9 aircraft is 1.98 Class A mishaps per 100,000 hours, respectively (U.S. Air Force, 2022a, b). These data include operations in military training or combat scenarios. This is consistent with other similar types of military aircraft. Based on the most recent 10 years of data, average Class A mishap rates for the C-130 aircraft are 0.55 Class A mishaps per 100,000 hours (U.S. Air Force, 2022a, b). This rate reflects all C-130 aircraft platform variations, including the KC-130J. The C-130, which has been upgraded continually since the 1950s, has one of the lowest Class A mishap rates of any aircraft in the DoD inventory.

A variety of safety measures are incorporated with flying an unmanned aircraft, and the MQ-9 has reported no midair collisions over the last 10 years, which constitute a total of approximately 2.6 million flight hours (U.S. Air Force, 2022a). A safety element unique to unmanned aircraft is ensuring the uninterrupted command and control of the MQ-9. The MQ-9 is a remotely piloted aircraft flown by a trained and certified Marine Corps Unmanned Aircraft Systems Pilot who has undergone a minimum of 2 years of training on a variety of manned and unmanned aircraft. The pilot controls the aircraft from a GCS, which serves as the “cockpit” for the aircraft. Functionally, the pilot’s control of the aircraft is the same as if they were sitting in the cockpit of the aircraft. In addition to manned operation, the aircraft has the capability to fly on “autopilot” using manually entered inputs such as global positioning system coordinates and flight paths. Pilots operate and monitor the aircraft’s systems to maintain positive control, while adhering to the laws and procedures outlined by the FAA. In addition to the redundant satellite and line-of-sight communication links between aircraft and ground control, the MQ-9 aircraft has several failsafe mechanisms designed into the aircraft in the event of an interrupted signal. If the aircraft loses contact with the GCS, it enters into a “lost link” profile, remaining in its established flight pattern, while communications are restored. In the unlikely event communication between ground control and the aircraft cannot be restored, the aircraft maneuvers itself to a safe and predetermined location off shore in accordance with FAA regulations and within a designated military operational area away from persons and property.

The pilot training, redundant communications systems, programmed failsafe mechanisms, and the operating area of the proposed aircraft help ensure safe operations of MQ-9 and KC-130J aircraft. Furthermore, the AICUZ program establishes safety areas at the airfield and in the immediate vicinity as well as land use controls in areas surrounding the installation to ensure safe operation of aircraft (MCB Hawaii, 2016). This includes specific zones over and around the airfield to allow suitable activities and facility heights to help ensure safe airfield operations. For these reasons, Alternative 1 would not have significant impacts to public health and safety.

3.7 Transportation

This discussion of transportation involves impacts of the proposed action to off-base roadways, bus routes, bikeways, and the two access gates into MCB Hawaii Kaneohe Bay.

3.7.1 Affected Environment

Figure 3-9 shows the transportation network immediately outside the installation and the two access gates to the installation.

3.7.1.1 Roadway Characteristics

Motor vehicle traffic into MCB Hawaii Kaneohe Bay is controlled by two security gates. The main gate is located at the north end of the H-3 highway (see Figure 3-9). It has two inbound and two outbound lanes, and is normally open 24 hours a day, 7 days a week. On a typical weekday, approximately 950 vehicles enter the main gate in the morning peak hour of traffic, and approximately the same number depart via the main gate in the afternoon peak hour of traffic (MCB Hawaii, 2021). The Mokapu gate is located on Mokapu Road, has one inbound and one outbound lane, and is open between 5:00 a.m. and 10:00 p.m. The roadways that provide access to MCB Hawaii Kaneohe Bay are identified in Table 3-9. Current level of service (LOS) data are not available for roadways outside the base; however, the 2010 LOS data indicated H-3 was LOS A (i.e., free flowing traffic) for most hours of the day, with LOS B (reasonably free flowing traffic) for the peak morning and afternoon traffic hours at H-3 outside the main entry gate. Considering U.S. Census data for on-base population showed a population of 9,517 in 2010 decreasing to 9,483 in 2020 (U.S. Census Bureau 2022a, b), it is reasonable to assume the 2010 LOS information is representative of existing conditions.

3.7.1.2 Bus Routes

“TheBus” is the County of Honolulu’s public bus transportation service. There are several bus routes serving the Kailua community in the vicinity of the base; however, there are no bus stops at MCB Hawaii Kaneohe Bay. The nearest bus stop is located at Aikahi Park Shopping Center, which is about 3,000 feet from the Mokapu gate (see Figure 3-9). The distance from the bus stop to the nearest MCB Hawaii Kaneohe Bay residential quarters is about 1.2 miles.

3.7.1.3 Bikeways

The existing bikeway network near MCB Hawaii Kaneohe Bay consists of shared use paths, bike lanes, and bike routes shared with roadways (City and County of Honolulu, 2019). Bike facilities near MCB Hawaii Kaneohe Bay include a shared use path along the east side of H-3 between Kaneohe Bay Drive and MCB Hawaii Kaneohe Bay main gate and a shared roadway along Kaneohe Bay Drive between Mokapu Road and H-3, which connects to other facilities within the Kailua community. Planned city bikeway improvements include a protected bike lane along Mokapu Road from Kaneohe Bay Drive to MCB Hawaii Kaneohe Bay Mokapu gate. In the vicinity of Mokapu Elementary School, striped bike lanes are provided on both sides of Mokapu Road from G Street to Harris Avenue (City and County of Honolulu, 2019).

3.7.2 Environmental Consequences

Impacts to ground traffic and transportation are analyzed by considering the possible changes to existing traffic conditions and the capacity of area roadways to operate at an acceptable LOS.

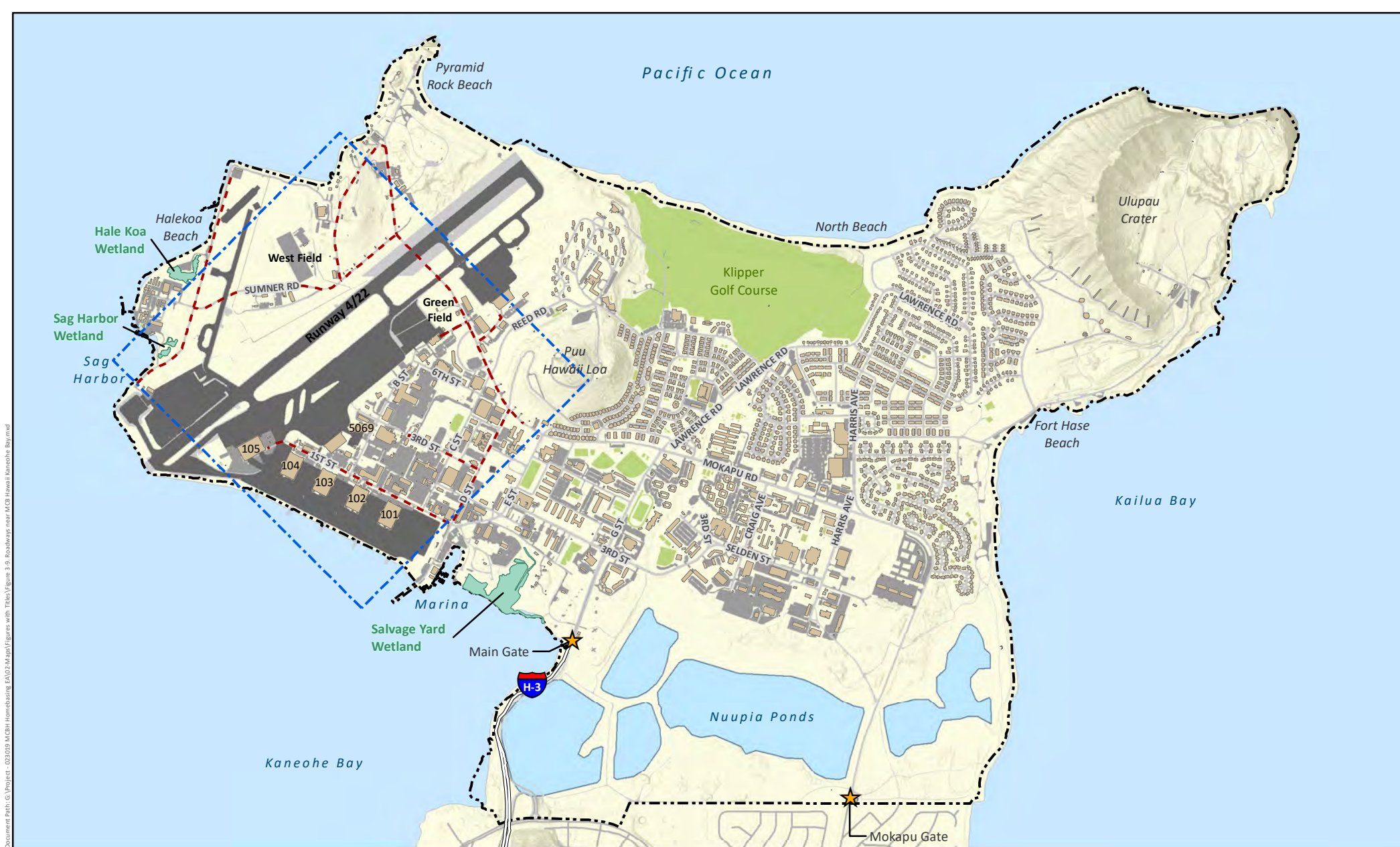
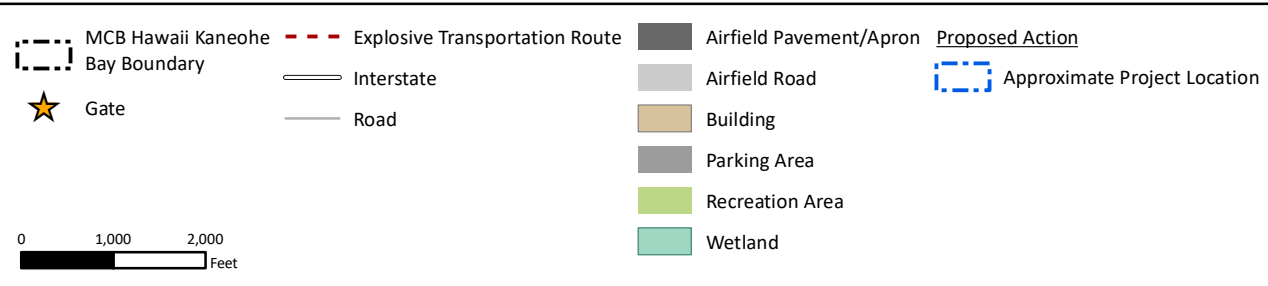


Figure 3-9. Roadways near MCB Hawaii Kaneohe Bay



Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

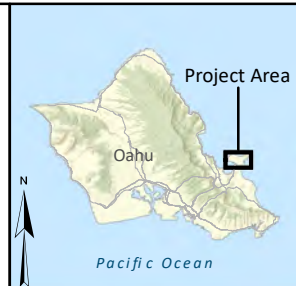


Table 3-9 External Roadway Characteristics

<i>Roadway</i>	<i>Description</i>	<i>Road Type</i>	<i># of Lanes</i>	<i>2020 AADT (HDOT, 2022)¹</i>
H-3	From Halawa, around Kaneohe, and to MCB Hawaii Kaneohe Bay	Interstate	Four – six (two-three in each direction)	13,400 ²
Mokapu Road	North Kalaheo Ave to MCB Hawaii Kaneohe Bay	Major Collector	Four (two in each direction)	9,400
Mokapu Blvd	North Kalaheo Avenue to Kaneohe	Principal Arterial	Four (two lanes in each direction)	10,000 ³
Kaneohe Bay Drive	North Kalaheo Ave to Mokapu Saddle Road	Major Collector	Two (one lane each direction)	7,300 ⁴
North Kalaheo Avenue	Mokapu Road/Blvd to Kailua Road	Major Collector	Two (one lane each direction)	11,900

Notes: ¹HDOT Federal-Aid Classification Update (HDOT, 2012). No updated guidance provided as this document was based on the 2010 census figures; AADT is a basic measurement that indicates vehicle traffic load on a road segment. AADT estimates the mean traffic volume across all days for a year for a given location along a roadway.

²Route H-3 Between MP 14.86 and 15.316 (HDOT, 2022).

³Route 65 Between MP 3.29 and 4.148 (HDOT, 2022).

⁴Route 6511 between MP 0.00 and 2.58 (HDOT, 2022).

Legend: AADT = Annual Average Daily Traffic; HDOT = Hawaii Department of Transportation; MCB = Marine Corps Base.

3.7.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur and there would be no change to transportation.

3.7.2.2 Alternative 1

Traffic

Construction Impacts

Construction traffic would occur on the segment of the H-3 freeway between the Mokapu Interchange and the MCB Hawaii Kaneohe Bay main gate. Construction traffic would be required to enter and exit the installation through the main gate. The Marine Corps estimated construction traffic using a recent comparable construction project (Mokapu Elementary School improvements) would be approximately 68 additional vehicle trips per day entering and exiting the installation at the main gate in the morning and afternoon peak periods, representing a 7% increase over normal conditions if all traffic were to occur in the same hour. While such an increase could cause delays in entering the base, it is similar to fluctuations that occur with other construction projects at MCB Hawaii Kaneohe Bay and are accommodated without affecting H-3 traffic (MCB Hawaii, 2021). The entrance to the main gate is at the end of the H-3 and approximately 0.5 mile from the last H-3 exit. Construction traffic (68 trips/day) would be less than 1% of average daily traffic volume on H-3 and have no effect on H-3 traffic, which averages 13,400 trips per day. As such, only traffic entering MCB Hawaii Kaneohe Bay would be minimally affected by the proposed action, and would not change the LOS of H-3 off base during peak or non-peak hours.

Construction vehicles and equipment would be limited to entering the installation through the main gate, so project construction would not impact the off-base neighborhood near Mokapu gate. An HDOT permit would be required to transport oversized equipment and overweight vehicles on state roadways, such as the H-3.

Considering the relatively small increase in construction traffic at the main gate, the temporary nature of the construction traffic, and the main gate's distance from the H-3, Alternative 1 construction would have less than significant impacts to traffic outside the installation.

Operational Impacts

The proposed action would add 676 active-duty personnel on base along with dependents in a gradual increase between FY 2023 and FY 2027. While additional aircraft operations at the airfield could cause traffic delays on base for personnel crossing the airfield, this proposed action results in 165 less personnel on base as compared to the base population before 2022. All such traffic would continue to be managed by a security guard stationed at the airfield to ensure traffic and aircraft safety. Squadron personnel and their dependents are anticipated to live on and off base in levels consistent with existing conditions; as such, no impacts to off-base road networks are anticipated. As a result, the change in traffic for personnel commuting or for personnel and dependents driving in the community would not change the LOS of H-3 average daily traffic volumes. As a result of the 165 less personnel compared to 2022 conditions, future traffic conditions are expected to be slightly better under the proposed action. Consequently, Alternative 1 operations would have less than significant impacts to traffic outside the installation.

Bus Routes

Alternative 1 would not impact bus operations on county and state right-of-way during the construction or operational periods, because there are no bus routes to MCB Hawaii Kaneohe Bay. Therefore, Alternative 1 would have no impacts to bus routes.

Bikeways

During the construction and operational periods, no changes would occur to bike facilities on county and state rights-of-way. Bikeways and access to bikeways would remain unchanged. Therefore, Alternative 1 would have no impacts to bikeways.

3.8 Summary of Potential Impacts to Resources

A summary of the potential impacts associated with Alternative 1 is presented in Table 3-1.

Table 3-10 Summary of Potential Impacts

<i>Resources</i>	<i>Alternative 1</i>
Noise	<ul style="list-style-type: none"> Minimal increase in average noise contours from aircraft operations. Less than significant impacts.
Air Quality	<ul style="list-style-type: none"> Less than significant impacts. Construction and operational activities would only minimally increase GHG emissions and would not substantially contribute to global warming.
Water Resources	<ul style="list-style-type: none"> Less than significant impacts to groundwater, surface water, wetlands, and floodplains.
Cultural Resources	<ul style="list-style-type: none"> Less than significant impacts to archaeological resources. Impacts to archaeological sites would be minimized through archaeological monitoring. Less than significant impacts to historic resources. Impacts to these resources would be reduced through incorporation of mitigation measures developed in the NHPA Section 106 and Section 110 process.
Biological Resources	<ul style="list-style-type: none"> Less than significant impacts to vegetation, wildlife, critical habitat, and ESA-listed species. The preferred alternative either may affect, but is not likely to adversely affect, ESA-listed species or has no effect on ESA-listed species.
Public Health and Safety	<ul style="list-style-type: none"> Less than significant impacts.
Transportation	<ul style="list-style-type: none"> Less than significant impacts to traffic, bus routes, and bikeways.

Key: ESA = Endangered Species Act; GHG = greenhouse gas; NHPA = National Historic Preservation Act.

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4 Cumulative Impacts

This section (1) defines cumulative impacts; (2) describes past, present, and reasonably foreseeable future actions in the project area; (3) analyzes the incremental interaction the proposed action may have with other reasonably foreseeable actions; and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, CEQ regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR 1508.1(g) as “effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.”

In addition, CEQ and USEPA have published guidance addressing implementation of cumulative impact analyses to include *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ, 2005), and *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (USEPA, 1999). The CEQ guidance *Considering Cumulative Impacts Under NEPA* (1997) which says cumulative impact analyses should “...determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions...identify significant cumulative impacts...[and]...focus on truly meaningful impacts.”

Cumulative impacts arise when a relationship exists between a proposed action and other actions expected to occur in a similar location and/or during a similar time period. To identify cumulative effects, the analysis addresses the following three fundamental questions.

- Does a relationship exist such that affected environmental components of the proposed action might interact with the affected environmental components of past, present, or reasonably foreseeable actions?
- If one or more of the affected environmental components of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur. Cumulative impacts assess the impact of the proposed action when viewed in context with other past, present, and reasonably foreseeable actions. Past actions are considered part of the “baseline” analysis, unless they are incomplete or ongoing, and future actions are included where they are sufficiently certain to occur. The timeframe for cumulative impacts centers on the timing of the proposed action. Effects of past actions are reflected in current baseline conditions.

4.3 Past, Present, and Reasonably Foreseeable Actions

Actions included in the cumulative impacts analysis are shown in Table 4-1 and Figure 4-1.

Table 4-1 Past, Present, and Reasonably Foreseeable Actions at MCB Hawaii Kaneohe Bay

<i>Index #</i>	<i>Action</i>	<i>Year</i>	<i>Description</i>
1	Regimental Consolidated Communications/Electrical Facility	2018–2022	<ul style="list-style-type: none"> Consolidation of facilities (20,423 square feet) in over seven facilities around the base.
2	Mokapu Gate Entry Control AT/FP Compliance	2018–2022	<ul style="list-style-type: none"> Demolition: Building 1188, under construction (2,800 square feet)
3	District CHW and DHW Plant for Buildings 7046, 6047, and 7057-7059	2020	<ul style="list-style-type: none"> Centralize water production to eliminate redundant chiller. New facility for the chiller pad, along with water lines (900 square feet).
4	Corrosion Control Hangar	2019–2023	<ul style="list-style-type: none"> Support paint stripping activities for tilt rotor and rotary wing aircraft (31,904 square feet).
5	Bachelor Enlisted Quarters (Aviation Support)	2020	<ul style="list-style-type: none"> Demolition: Walkways 1003, 1004, and 1005; Buildings 227, 228, 3000 and cooling plant (341,001 square feet).
6	Waikulu Family Housing	2018	<ul style="list-style-type: none"> Redeveloped into 375 three- and four-bedroom duplexes and multiplexes.
7	Hana Like Family Housing	2018	<ul style="list-style-type: none"> Redeveloped into 182 three- and four-bedroom duplexes and multiplexes.
8	Mokapu Elementary School Campus Improvements	2023	<ul style="list-style-type: none"> Redevelopment of existing school campus for classrooms, administration, library, and cafeteria facilities, along with a covered playcourt, playfield, and surface parking lots (162,000 square feet).
9	Helicopter Squadrons Deactivation	2021-2022	<ul style="list-style-type: none"> AH-1/UH-1 squadron (27 aircraft) and the CH-53E squadron (15 aircraft) were deactivated, and the RQ-21 squadron was divested from the VMU squadron. Resulted in a decrease of approximately 841 personnel plus family members.
10	3 rd MLR in Hawaii	2023	<ul style="list-style-type: none"> Construction of required supporting facilities, and associated training.
11	Dog Kennel	2021	<ul style="list-style-type: none"> Demolition of Building 5090, reconstruction in place (larger than Building 5090).
12	Rappel Tower and Gas Chamber	2021	<ul style="list-style-type: none"> Demolition: Building 6042. Reconstruct in place, total of 3,700 feet (larger than Building 6042).
13	Bachelor Enlisted Quarters	2022–2026	<ul style="list-style-type: none"> 180-person quarters. Buildings 1655 and 1656 (48,470 square feet).

Table 4-1 Past, Present, and Reasonably Foreseeable Actions at MCB Hawaii Kaneohe Bay

<i>Index #</i>	<i>Action</i>	<i>Year</i>	<i>Description</i>
14	Phase 1 Electrical Distribution Modernization, Base-wide	2022–2026	<ul style="list-style-type: none"> Repair and upgrade various components of the electrical distribution system, including substations, switching stations, and addition of SCADA System. Renovates primary substations 1125, 5033, 820, 5092 (13,681 square feet).
15	Bachelor Enlisted Quarters	2024–2028	<ul style="list-style-type: none"> 200-person quarters. Demolition: Building 386, 1634, and 1635 (47,620 square feet).
16	Wastewater Treatment Plant Redundancy and Modernization	2025–2031	<ul style="list-style-type: none"> Upgrade the Base WWTP to provide redundant treatment systems to address State of Hawaii recommendation and for contingency operations in case of failure of critical components. Demolition: Sludge Beds 977 and 978.
17	Nuupia Main Gate Entry Control AT/FP Compliance	2025–2028	<ul style="list-style-type: none"> Demolition: Buildings 1636 and 1637. Reconstruct in place.
18	Maintenance Facility	2026–2030	<ul style="list-style-type: none"> New consolidated maintenance facility and warehouse storage, and replacement van pads. Demolition: Van Pads C and D (53,733 square feet).
19	Phase 2 Electrical Distribution Modernization	2026–2030	<ul style="list-style-type: none"> Repair and upgrade various components of the electrical distribution system. Demolition: Buildings 1274 and 1628.
20	3 rd MLR Regiment Operations Complex	2027–2031	<ul style="list-style-type: none"> Demolition: Buildings 1284, 6765CE (shelter that looks like a building). Possible change to Oil/Water Separators 6085 and 6786 (27,997 square feet).
21	Multi-purpose Training Complex	2027–2031	<ul style="list-style-type: none"> Facility to support training using simulators that are housed in temporary and semi-permanent facilities. Includes new rappel tower and gas chamber. Demolition: Building 6076; Temporary Facilities 6757C3, 6758C3, 6756C3, 6755C3, 6708C3, 6710C3, 6781C3, 6771C3, Rappel Tower 6042, Gas Chamber 6006, and Leadership Reaction Course 6075 (36,231 square feet).
22	Bachelor Enlisted Quarters	2027–2031	<ul style="list-style-type: none"> 200-person Bachelor Enlisted Quarters to support new Aviation Squadrons and MWSS. This is third part of original 608 Bed P-886. Demolition: Buildings 1604 and 1632.

Table 4-1 Past, Present, and Reasonably Foreseeable Actions at MCB Hawaii Kaneohe Bay

<i>Index #</i>	<i>Action</i>	<i>Year</i>	<i>Description</i>
23	MAG-24 Armory Expansion MV-22 EIS	2028– 2030	<ul style="list-style-type: none"> Expands Building 4054 (Armory) to meet the needs of MWSS, VMU and MV-22. Demolition: three existing modular armories and one concrete armory (11,905 square feet).
24	New Operational Pier	2028– 2032	<ul style="list-style-type: none"> New pier for ordnance loading and offloading.
25	3 rd LCT Complex Part of MLR project.	2028– 2032	<ul style="list-style-type: none"> Construct new vehicle maintenance facility, armory, field maintenance shop, electrical/communications maintenance shop, warehouses, and headquarters. Replaces tension fabric structures that in place since 2009.
26	Regimental Headquarters Part of MLR.	2029– 2031	<ul style="list-style-type: none"> Demolition: Building 1088. Reconstruct in place.
27	Bachelor Enlisted Quarters Part of MLR.	2029– 2032	<ul style="list-style-type: none"> 111-person quarters. Demolition: Buildings 1633 and 1654.
28	Ordnance Storage Magazine	2029– 2032	<ul style="list-style-type: none"> Replace existing modular ammunition magazines at Ulupau Ammunition Storage Facility with a permanent aboveground, earth-covered magazine to meet requirements of SAFER Site Approval. Removes: aboveground steel magazines 6168, 6169, and 6170 (4,747 square feet).
29	CISD and MITSC Facilities	2029– 2033	<ul style="list-style-type: none"> New facility for use by the Directorate of Communications and Information Systems. Includes administrative, storage, shop, and computer equipment spaces. Relocate: Building 1089 ADN (25,629 square feet).
30	CLB-3 Maintenance Complex and Warehouse Part of MLR	2029– 2033	<ul style="list-style-type: none"> Consolidated CLB-3 maintenance complex and warehouse. Affected: Buildings 250, 269, 388, 3013, 3014, 3015, 3017, 3018, 3019, 1565, 1677, and 6039.
31	Fire Station	2030– 2033	<ul style="list-style-type: none"> Larger fire station in new location. Provides replacement dance/gymnastics facility that would be displaced as well as temporary fire station during construction (30,860 square feet).
32	Alternate Communications Feeder	2030– 2034	<ul style="list-style-type: none"> New communications ductbank, renovates Building 213, and upgrades Building 276A (5,016 square feet).
33	Physical Fitness Center	2031– 2035	<ul style="list-style-type: none"> Replace existing fitness center.

Table 4-1 Past, Present, and Reasonably Foreseeable Actions at MCB Hawaii Kaneohe Bay

<i>Index #</i>	<i>Action</i>	<i>Year</i>	<i>Description</i>
34	Consolidated Classroom Facility (Operations and Training)	2032–2036	<ul style="list-style-type: none"> Associated with P-843. Demolition: Building 6709C3 (32,442 square feet).
35	C-40 Aircraft Maintenance Hangar and Parking Apron	TBD	<ul style="list-style-type: none"> Renovation of Hangar 104 to accommodate two C-40 aircraft

Notes: Project locations are shown by index number in Figure 4-1.
 ADN = Area Distribution Node; AT/FP = Anti-Terrorism/Force Protection; CHW = Chilled Water; CLB = Combat Logistics Battalion; CISD = Communications & Information Systems Division; DHW = Domestic Hot Water; LCT = Littoral Combat Team; MITSC = Marine Air-Ground Task Force Information Technology Support Center; MLR = Marine Littoral Regiment; MWSS = Marine Wing Support Squadron; SAFER = Safety Assessment for Explosive Risk; SCADA = Supervisory Control and Data Acquisition; TBD = To Be Determined; VMU = Marine Unmanned Aerial Vehicle Squadron; WWTP = Waste Water Treatment Plant.

Source: MCB Hawaii, 2022c.

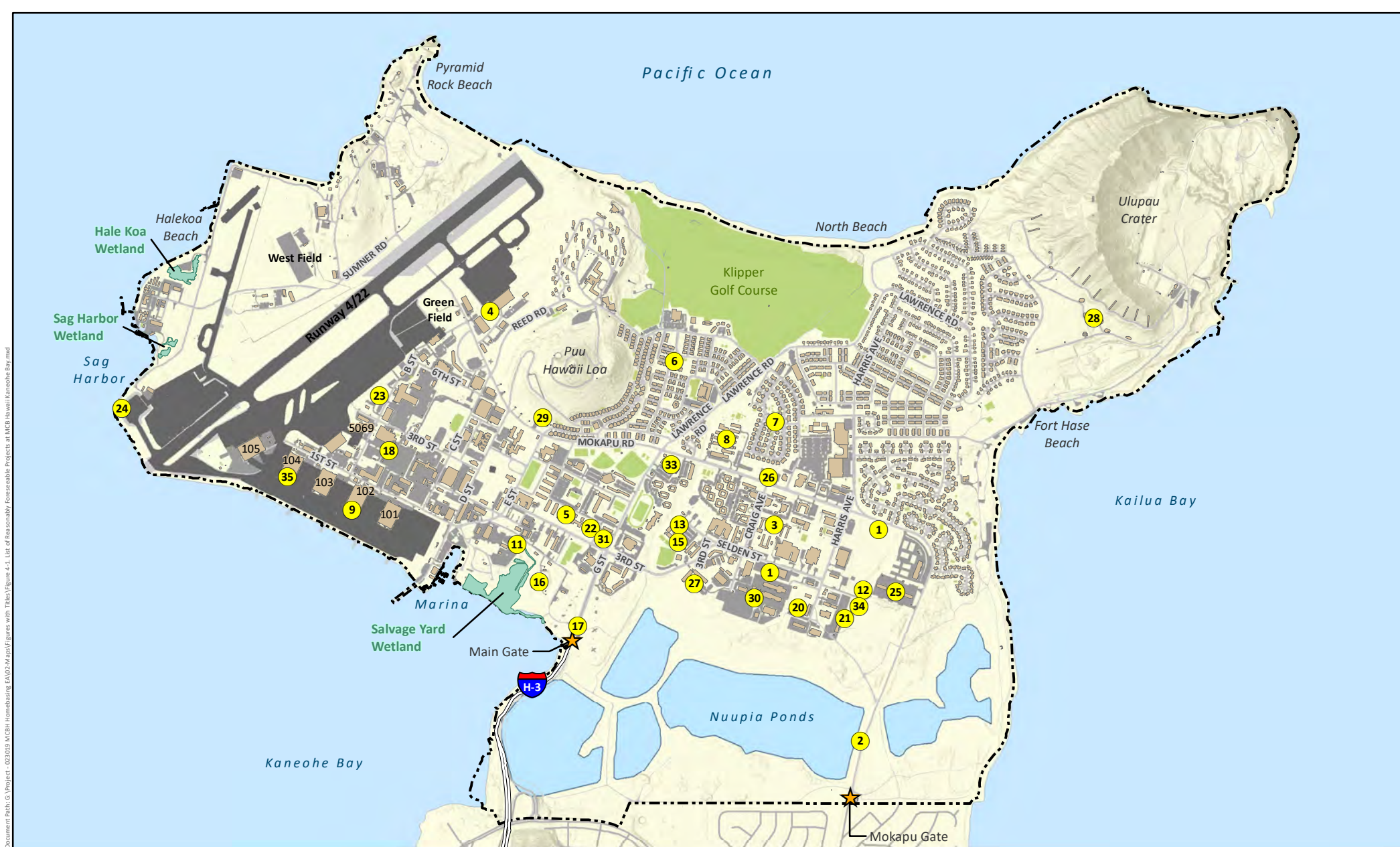
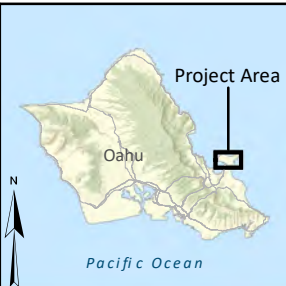
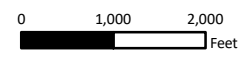


Figure 4-1. List of Reasonably Foreseeable Projects at MCB Hawaii Kaneohe Bay

MCB Hawaii Kaneohe Bay Boundary	Interstate	Airfield Pavement/Apron
Gate	Road	Airfield Road
Reasonable Foreseeable Projects		Building
		Parking Area
		Recreation Area
		Wetland

Note: Projects are listed by Index Number in Table 4-1.



Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

Document Path: G:\Project - 023019 MCBH Homebasing EA\02-Maps\Figures with Titles\Figure 4-1. List of Reasonably Foreseeable Projects at MCB Hawaii Kaneohe Bay.mxd

4.4 Cumulative Impact Analysis

Noise. The past, present, and future actions within foreseeable projects would include the use of construction equipment that would result in increased temporary intermittent noise levels within the region of influence. The timing of some future projects may overlap temporally and geographically with the construction period of the proposed action. However, noise level increases would be temporary and typical of standard construction activities as identified in the Noise resource section. While individual construction activities would temporarily increase noise levels in the area of construction, the varied scale, location, and timing of future construction, and the relatively short duration of noise effects would result in less than significant cumulative impacts.

The projects identified in Table 4-1 would have minimal operational noise impacts. Long-term aircraft operations would continue to be the dominant sources of noise at MCB Hawaii Kaneohe Bay. The cumulative impact analysis considers recent actions such as the deactivation of the helicopter squadrons that was completed in 2022. When considering the deactivation of helicopter squadrons cumulatively with the proposed addition of two aircraft squadrons under the proposed action, there is a decrease in aircraft operations that results in less noise in the region of influence. With regards to future projects, distinct from the proposed action — which is adding two new aircraft squadrons — future projects are improvements or additions to existing infrastructure and are not introducing new noise sources. As such, in the absence of any new, permanent operational noise sources, implementation of the proposed action would not result in significant cumulative noise impacts within the region of influence.

Air Quality. The past, present, and future actions within foreseeable projects would include the use of construction equipment that would result in increased temporary air emissions in the region of influence from construction equipment similar to that identified in the Air Quality resource section. The timing of some future projects may overlap temporally and geographically with the construction period of the proposed action. Considering the minor increase to air emissions and negligible impact to GHGs identified for the proposed action, applying the same BMPs to future construction projects would result in less than significant cumulative effects to air quality. With regards to GHGs, construction activities for reasonably foreseeable projects would temporarily increase GHG emissions. The statewide GHG projection is 12.85 million tons of GHGs for 2020 (DOH, 2021a), and the estimated annual average GHG increase of the proposed action would be less than 0.002 percent of the 2020 GHG projection. The magnitude of each project in Table 4-1 on average would be the same or less than the proposed action, so even a conservative estimate would result in reasonably foreseeable actions being less than 0.01 percent of the 2020 GHG projection. Such a temporary and small annual increase over the 2020 projection level results in a less than significant impact to GHG emissions. As with Noise, future projects consist principally of new and improved infrastructure with little new air emissions. As such, operational air pollutant emissions would not substantially change from existing conditions, and thus the proposed action would not result in significant cumulative air quality impacts within the region of influence.

Water Resources. With regards to future construction in the region of influence, conservation measures identified in Table 2-5 for the proposed action would be equally applicable to all future projects, thereby avoiding or minimizing the transport of project-related sediments or pollutants to water resources in the region of influence. All projects would include appropriate storm water quality and LID features similar to the proposed action to reduce the potential for off-site transport of pollutants. While additional increases in impervious surfaces is expected, the location of future projects within the highly developed base would result in only minor increases in storm water runoff, which would be managed in accordance with the SWPPP for industrial activities, as required by the NPDES General Permit Waste Discharge

Requirements for Discharges of Storm Water Associated with the Industrial General Permit. No jurisdictional wetlands within the region of influence would be impacted. Therefore, implementation of the proposed action would not result in significant cumulative water quality impacts within the region of influence.

Cultural Resources. The NAS Kaneohe Aviation District has been impacted over time with the demolition of 15 contributing buildings, structures, and objects between 2006 and 2022. There are an additional 7 buildings proposed for demolition in connection with future projects, including the proposed action. Hangars 103 and support buildings 159, 160, 161, 183, and 184 would be demolished in the proposed action. This would leave fewer remaining contributing resources in the Aviation District.

MCB Hawaii, in support of Navy proposed action, is currently conducting NHPA Section 106 consultation and developing the project details for the replacement of an existing hangar for C-40 aircraft. Though other historic buildings and structures may be considered for demolition in the future based on mission needs, there are no other demolitions being planned at this time. Additionally, as with the proposed action, all future projects would mitigate any adverse effects through the NHPA 106 and 110 process. While past, present, and future projects have and would adversely impact individual contributing resources, collectively, they would not result in removing the listing eligibility of the Aviation District. Moreover, except for the Bravo Ramp resurfacing and repaving included in the proposed action, there would be no current or planned adverse effects to NHL contributing resources. Because both the NHL and Aviation District would retain enough integrity to remain listed or eligible for the NRHP, cumulative impacts to cultural resources within the region of influence would be less than significant.

Biological Resources. While construction-related noise may temporarily displace such wildlife from habitat in the immediate vicinity of the project areas, future construction would occur at previously developed and actively used areas, construction noise would be temporary and in many cases would be similar to operational activities that currently occur throughout the installation, and conservation measures identified in Table 2-5 would be applied to future projects to further avoid or minimize potential effects to wildlife (including ESA-listed species) during the construction. Conservation measures to educate contractors and military personnel about natural resources and ESA-listed species would also continue to be implemented. For operations, as discussed in the Noise section, the nature of the projects would not introduce new noise sources, nor significantly increase noise contours at the base. For projects in currently previously undisturbed areas, vegetation restoration, to include ground preparation, planting, temporary irrigation, and maintenance; restored turf grass vegetation installation over a bio-degradable erosion-control fabric; and use of native plant species to the maximum extent practicable would further lessen any impacts to biological resources. As such, implementation of the proposed action would not result in significant cumulative impacts to biological resources in the region of influence.

Public Health and Safety. Future construction activities would consist of activities similar to the proposed action and occur entirely within installation boundaries. All future operations would similarly occur only on base. No changes to safety plans, AICUZ, or BASH Management Plan at MCB Hawaii Kaneohe Bay is anticipated as a result of the proposed action and future projects. Considering all actions would occur on base and are consistent with present operations, implementation of the proposed action would not result in significant cumulative public health and safety impacts within the region of influence.

Transportation. Cumulative impacts to transportation that would occur with implementation of the Proposed Action would include minor increases in traffic within the region of influence. For construction projects that overlap in time, there would be a temporary cumulative construction traffic impact and may contribute some on-base traffic growth on the H-3 and accessing the installation through the Main Gate. However, any increase, even from multiple projects, is not anticipated to be significant. The proposed action would increase average daily traffic volume on H-3 less than 1%. At any given time, no more than three projects would be underway including the proposed action. As such, assuming the construction impacts are similar among projects, at a 3% worse-case scenario, any increase would not result in a significant cumulative impact. With regards to operations, because of deactivation of the two helicopter aircraft squadrons completed in 2022, by the time the proposed action is fully operational in FY 2027, there would be a net decrease in personnel of 165 personnel plus dependents. All of the future projects are upgrades to the existing infrastructure and not anticipated to increase base personnel. Consequently, the proposed action would not contribute to significant cumulative impacts to traffic outside the installation.

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Appendix A

Regulatory Setting

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**Appendix A: Regulatory Setting
Environmental Assessment**

**Marine Corps Base Hawaii Home Basing of the MQ-9A Marine
Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial
Refueler Transport Squadron at Marine Corps Base Hawaii Kaneohe
Bay**

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Abbreviations and Acronyms

%	percent	NHPA	National Historic Preservation Act
ACHP	Advisory Council on Historic Preservation	NMFS	National Marine Fisheries Service
AICUZ	Air Installations Compatible Use Zone	NO ₂	nitrogen dioxide
APE	Area of Potential Effects	NPDES	National Pollutant Discharge Elimination System
CAA	Clean Air Act	NRHP	National Register of Historic Places
CEQ	Council on Environmental Quality	O ₃	ozone
CFR	Code of Federal Regulations	OPNAVINST	Chief of Naval Operations Instruction
CO	carbon monoxide	Pb	lead
CWA	Clean Water Act	PM ₁₀	particulate matter with diameter less than or equal to 10 micrometers
CZMA	Coastal Zone Management Act	PM _{2.5}	particulate matter with diameter less than or equal to 2.5 micrometers
DoD	Department of Defense	SHPO	State Historic Preservation Office(r)
EA	Environmental Assessment	SO ₂	sulfur dioxide
EO	Executive Order	SWPPP	Storm Water Pollution Prevention Plan
ESA	Endangered Species Act	U.S.	United States
FAA	Federal Aviation Administration	U.S.C.	United States Code
GHG	Greenhouse Gas	USEPA	United States Environmental Protection Agency
HDOH	Hawaii Department of Health	USFWS	United States Fish and Wildlife Service
MBTA	Migratory Bird Treaty Act		
MCB	Marine Corps Base		
MCO	Marine Corps Order		
NAAQS	National Ambient Air Quality Standards		
NAGPRA	Native American Graves Protection and Repatriation Act		
NEPA	National Environmental Policy Act		
NHO	Native Hawaiian Organization		

Appendix A: Regulatory Setting

The Marine Corps has prepared this Environmental Assessment (EA) based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the proposed action. These are summarized in Table 1 and in the text below.

Table 1 Applicable Laws and Regulations

<i>Title</i>	<i>Citation</i>
Archaeological Resources Protection Act (ARPA)	16 U.S.C. §§ 470aa-470mm
Clean Air Act (CAA)	42 U.S.C. §§ 7401-7671q
Clean Water Act (CWA)	33 U.S.C. §§ 1251-1387
Coastal Zone Management Act (CZMA)	16 U.S.C. §§ 1451 et seq.
Council on Environmental Quality National Environmental Policy Act Regulations	40 CFR §§ 1500-1508
Endangered Species Act	16 U.S.C. §§ 1531-1544
EO 11988, Floodplain Management	42 Fed. Reg. 26951
EO 12088, Federal Compliance with Pollution Control Standards	43 Fed. Reg. 47707
EO 12372, Intergovernmental Review of Federal Programs	47 Fed. Reg. 30959
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	59 Fed. Reg. 7629
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	62 Fed. Reg. 19885
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, and the Migratory Bird Treaty Act (MBTA)	66 Fed. Reg. 3853, 16 U.S.C. §§ 703-712
National Environmental Policy Act (NEPA)	42 U.S.C. §§ 4321-4370h
National Historic Preservation Act (NHPA)	54 U.S.C. §§ 300101 et seq.
Native American Graves Protection and Repatriation Act (NAGPRA)	25 U.S.C. §§ 3001-3013
Policies and Responsibilities for Implementation of the National Environmental Policy Act Within the Department of the Navy	32 CFR Part 775
Pollution Prevention Act (NPA)	42 U.S.C. §§ 13101-13109
Protection of Historic Properties	36 CFR Part 800
Resource Conservation and Recovery Act (RCRA)	42 U.S.C. §§ 6901 et seq.
Marine Corps Environmental Compliance and Protection Program	MCO 5090.2

Notes: CFR = Code of Federal Regulations; EO = Executive Order; MCO = Marine Corps Order; U.S.C. = United States Code.

1.1 Noise

Federal, state, and local governments regulate noise to prevent noise sources from affecting noise sensitive areas, such as residences, hospitals, and schools, and to protect human health and welfare. The Noise Control Act of 1972, 42 United States Code (U.S.C.) 4901 et seq., established a national policy “to promote an environment for all Americans free from noise that jeopardizes their health or welfare.” The joint instruction, Chief of Naval Operations Instruction (OPNAVINST) 11010.36C and Marine Corps Order (MCO) 11010.16, *Air Installations Compatible Use Zones (AICUZ) Program*, provides guidance administering the AICUZ program, which recommends land uses that are compatible with aircraft noise levels. Per OPNAVINST 11010.36C/MCO 11010.16, NOISEMAP is used for developing noise contours.

1.2 Air Quality

1.2.1 Criteria Pollutants

Under the Clean Air Act (CAA), the United States (U.S.) Environmental Protection Agency (USEPA) established National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] Part 50) for six criteria air pollutants, including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead (Pb), and particulate matter with diameters less than or equal to 10 and 2.5 micrometers (PM₁₀ and PM_{2.5}). The USEPA classifies NAAQS as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. The USEPA designated short-term standards to protect against acute health effects and established long-term standards to protect against chronic health effects.

The USEPA designates areas that are and have historically been in compliance with the NAAQS as attainment areas and designates areas that violate a federal air quality standard as nonattainment areas. The USEPA designates areas that have transitioned from nonattainment to attainment as maintenance areas; these areas must adhere to maintenance plans to ensure continued attainment.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated as nonattainment. State and local air quality management agencies develop these plans, known as State Implementation Plans, and submit them to the USEPA for approval.

1.2.2 Greenhouse Gases

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The scientific community predicts the climate change associated with this global warming will produce negative environmental, economic, and social consequences across the globe.

The Council on Environmental Quality (CEQ) provides guidance on how GHG emissions and climate change impacts should be analyzed under the National Environmental Policy Act (NEPA) in its 2016 *Final Guidance for Federal Departments and Agencies on Consideration of GHG Gas Emissions and the Effects of Climate Change in NEPA Reviews*. That guidance was withdrawn in 2017 and is currently under review by the CEQ for revision and update.

1.3 Water Resources

Several statutes regulate water resources. The Safe Drinking Water Act, 42 U.S.C. 300 et seq. (1974) sets standards for maximum levels of contaminants in drinking water.

The Clean Water Act (CWA), 33 U.S.C. 1251 et seq. (1972) establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amount of pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (e.g., end of pipe) and nonpoint (e.g., storm water) sources of water pollution. The NPDES program is administered through the Hawaii Department of Health (HDOH). The state NPDES program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under a NPDES Construction General Permit for storm water discharges. Construction or demolition that

necessitates an individual permit also requires preparation of a Notice of Intent to discharge storm water and a Storm Water Pollution Prevention Plan (SWPPP) that is implemented during construction.

Impacts to wetlands are regulated by the U.S. Army Corps of Engineers under Section 404 of the CWA as a subset of all “waters of the United States.” Section 404 of the CWA establishes a program to regulate the discharge or fill of material into a wetland, and authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands.

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 development in a floodplain unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a 1 percent (%) chance of inundation by a flood event in a given year. EO 11988 states that agencies shall provide opportunity for early public review of any plans or proposals for actions in floodplains.

EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, amends EO 11988 and establishes the Federal Flood Risk Management Standard to improve the nation’s resilience to current and future flood risks, which are anticipated to increase over time as a result of climate change and other threats.

Section 307 of the Coastal Zone Management Act (CZMA) stipulates that where a federal project initiates reasonably foreseeable effects to any coastal use or resource (land or water use, or natural resource), the action must be consistent to the maximum extent practicable with the enforceable policies of the affected state’s federally approved coastal management plan. The Hawaii State Office of Planning implements the state’s CZMA program.

1.4 Cultural

Federal laws and regulations that protect cultural resources include the National Historic Preservation Act (NHPA) (16 U.S.C. §§470aa–470mm); the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (25 U.S.C. §§3001-3013); and the American Indian Religious Freedom Act (42 U.S.C. § 1996).

Section 110 and Section 106 of the NHPA define federal agencies’ responsibilities for protecting historic properties. Section 110 of the NHPA requires federal agencies to establish historic preservation programs for the identification, evaluation, and protection of historic properties. Section 106 requires federal agencies to consider the effects of their undertakings on historic properties either listed in or eligible for listing in the National Register of Historic Places (NRHP). The Section 106 consultation process affords the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), Native Hawaiian Organizations (NHOs), interested parties, and the public an opportunity to consult on a proposed undertaking. Additionally, the NHPA and its implementing regulations include provisions for consultation with NHOs that attach religious and cultural significance to historic properties that may be affected by an undertaking (36 CFR 800.2).

An undertaking is defined in NHPA Section 106 regulations as a “project, activity or program funded in whole or part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license or approval” (36 CFR 800.16). An undertaking adversely affects a historic

property if it alters the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property (36 CFR 800.5).

The NHPA defines a historic property as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP, including related artifacts, records, and remains (36 CFR 800.16). During Section 106 consultation, the federal agency identifies historic properties that may be affected by an undertaking (36 CFR 800.4). The NRHP includes criteria for evaluating the significance and integrity of a historic property to determine eligibility, as set forth in 36 CFR 60.4. In addition to significance, eligible properties must retain historic integrity, defined as the ability of a property to convey its significance, based on its location, design, setting, materials, workmanship, feeling, and association. Once historic properties are identified, the federal agency assesses whether there are adverse effects on historic properties in the Area of Potential Effects (APE) of the undertaking. The APE is defined in 36 CFR Part 800.16(d) as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.”

The assessment of effects on historic properties under NEPA identifies and describes the consequences of the proposed action on cultural resources. This analysis is aligned with the determinations and assessments prepared under the concurrent Section 106 consultation process for the proposed undertaking, which is equivalent to the NEPA Preferred Alternative.

1.5 Biological Resources

The purpose of the Endangered Species Act (ESA) is to conserve the ecosystems upon which threatened or endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) in assessing whether the proposed action may jeopardize the continued existence of federally listed threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. There is no federally designated critical habitat for any ESA-listed species on, or close to, the project area or within the ROI.

Birds, both migratory and most native-resident bird species, are protected under the Migratory Bird Treaty Act (MBTA), and their conservation by federal agencies is mandated by EO 13186, *Migratory Bird Conservation*. Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, or possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act authorized the Secretary of the Interior to prescribe regulations exempting the Department of Defense (DoD) from the incidental taking of migratory birds during authorized military readiness activities. These regulations require DoD to confer with the USFWS to develop and implement appropriate conservation measures to minimize or avoid adverse effects of the proposed action if it would have a significant negative impact to the sustainability of a population of a migratory bird species.

1.6 Public Health and Safety

Aircraft operations are regulated by the Federal Aviation Administration (FAA) (see Federal Aviation Regulations Part 91, *General Operating and Flight Rules*). These regulations and associated FAA Orders set forth rules for military aircraft operating in commercial and military airspace. In addition, Navy policy and procedural guidance provides further operating requirements for military aircraft (e.g., Naval Air Training and Operating Procedures Standardization General Flight and Operating Instruction,

OPNAVINST 3710.7U [2009], and various Naval Air Training and Operating Procedures Standardization manuals).

1.7 Transportation

The State of Hawaii follows the U.S. Department of Transportation Federal Highway Administration’s highway functional classification definitions. The functional classification process groups streets and highways according to the character of service they are intended to provide. The types of functional classifications are presented in Table 2 and apply in both urban and rural settings.

Table 2 Highway/Roadway Functional Classification

<i>Highway/Roadway Functional Classification</i>		<i>Description</i>
Interstate		Provide basic interstate service and link major cities
Arterial	Principal	Provide high level of interstate and intrastate service and connect major generators of internal city traffic
	Minor	Serve trans-state travel to and through principal cities and provide a system for the major traffic generators within a city
Collector	Major	Provide connections to and through the large centers of population within the state
	Minor	Provide inter-county service
Local		Service small rural communities and provide access to residential areas and neighborhoods within cities

Source: Federal Highway Administration, 2013.

Along with identifying the intended role of each roadway, the classification can also align with roadway design characteristics, such as the speed, capacity, and connection to existing and future land uses in the area.

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Appendix B
Public and Agency Correspondence

To be provided

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Appendix C
National Historic Preservation Act Section 106 Consultation

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UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
KANEHOE BAY, HAWAII 96863-3002

5090
LFE/001-22
January 7, 2022

Dr. Alan Downer
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

Dear Dr. Downer:

SUBJECT: SECTION 106 CONSULTATION (Architecture & Archaeology):
Proposed MCBH Home Basing of The MQ-9A Unmanned Air System
and KC-130J Aerial Transport Refueling Aircraft Aboard Marine
Corps Base Hawaii, Kaneohe Bay, District Of Ko'olaupoko,
Ahupua'a of He'eia, O'ahu, TMK 1-4-4-008:001.

Marine Corps Base Hawaii (MCBH) is consulting with your office in compliance with Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed undertaking by the U.S. Marine Corps to implement the Home Basing of the MQ-9A Unmanned Air System and KC-130J Aerial Transport Refueling Aircraft at the Kaneohe Bay installation (hereinafter referred to as the MCBH Home Basing project). MCBH has determined that the proposed project is an undertaking as defined in 36 CFR §800.16(y). This letter initiates our Section 106 consultation for this undertaking.

PROJECT DESCRIPTION

The MCBH Home Basing project is located in the southwest portion of Mokapu Peninsula [enclosure 1]. The project is centered on the area around Hangars 2 and 3 (Facilities 102 and 103) and includes support areas at Pali Kilo, West Field, Charlie Ramp, Transient Ramp, and Crescent Circle (for construction laydown). The undertaking includes home basing a Marine Corps MQ-9A Extended Range Unmanned Aerial Vehicle (UAV) squadron (6 aircraft) and a KC-130J aircraft squadron (15-aircraft) at MCBH Kaneohe. Each squadron consists of personnel, aircraft, and supporting infrastructure. The MQ-9A squadron would conduct UAV training operations, and the KC-130J squadron would conduct aerial refueling. The proposed action would enable the USMC to meet their Title X requirement to provide, train, and equip forces for the Combatant Commander through increasing the capability, versatility, and range of USMC forces in Hawaii.

The MCBH Home Basing project will house the MQ-9A squadron in Hangar 102 and house the KC-130J squadron in the hangar currently occupied by the MV-22 squadron (Facility 6886). It would include demolition of Hangar 3 (Facility 103) and ancillary Aircraft Spares Storage Buildings (Facilities 159, 160 and 161) adjacent to Hangar 3 and construction of a new Type II hangar on its footprint to house the MV-22 squadron. The new hangar will have a steel-frame construction with standing seam metal roofing, concrete filled metal deck floors, and a pile foundation. MCBH also proposes to demolish Facilities 4000 (G-3 Storage) constructed in 1986, and 5068 (Aircraft Rescue), built in 1991, located at the Hot Fuel Pit.

The overall proposed scope of work includes:

- (1) Restripe Charlie Ramp.
- (2) Resurfacing/repaving, and striping of Bravo Ramp.
- (3) Installation of Tie-downs at Bravo Taxi Ramp and Bravo-1.
- (4) Installation of Tie-downs west of Hangar 5 and striping of pavement at the west end of Runway 4/22.
- (5) Replacing taxiway asphalt.
- (6) Hangar 102 modifications to accommodate MQ-9A.
 - (1) Interior upgrades: electrical, mechanical and communication systems.
 - (2) Training simulator.
 - (3) Interior Interim Sensitive Compartmentalized Information Facility (ISCIF).
- (7) Constructing a KC-130J wash rack.
- (8) Two Ground Control Stations (GCSs) with Environmental Control Units (ECUs).
 - (1) Hangar 102.
 - (2) Adjacent to Building 6002.
- (9) Two Ground Data Terminals (GDTs).
 - (1) Keawanui Hill.
 - (2) Adjacent to Hangar 105.
- (10) Construction laydown and staging area at Crescent Circle.
- (11) Demolish Hangar 103 (Hangar 3).
- (12) Construct Type II Hangar 103 aircraft maintenance hangar for MV-22s.
- (13) Reconfigure Hangar 6886 interior spaces from MV-22 to KC-130J use.
- (14) Construct new support facilities adjacent to Hangar 6886.
 - (1) Storage Facility.
 - (2) Propeller Maintenance Facility.
- (15) Construct new Hot Refuel Pit, includes demolition of Facilities 4000 and 5068.
- (16) Restricted area boundary perimeter security fencing.
- (17) Demolition of Facilities 159, 160, and 161 (Aircraft Spares Storage).

See enclosure 2 for a tabular accounting of the above projects and enclosure 3 for a map graphic showing the location of the project elements keyed to the table.

AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) for this project consists of the Kaneohe Naval Air Station National Historic Landmark District (NHL), the Naval Air Station (NAS) Kaneohe Historic Aviation District (Aviation District), which includes the NHL, Bravo Ramp, Charlie Ramp, Transient Ramp, the Mokapu House Lots Archaeological District at Pali Kilo, portions of the West Field area to the north of the runway, and areas that are adjacent to the Aviation District east of Charlie Ramp and Transient Ramp [enclosure 4].

IDENTIFICATION OF HISTORIC PROPERTIES

Pursuant to the National Historic Preservation Act (NHPA), Section 106 Implementing Regulations at 36 CFR 800.4(b), qualified preservation professionals have carried out the identification of historic properties within this project's area of potential effects (APE) in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Architecture

There are approximately 65 architectural resources within the APE, as well as three (3) historic districts: the Naval Air Station (NAS) Kaneohe Historic Aviation District, the Kaneohe Naval Air Station National Historic Landmark (NHL), and the Mokapu House Lots Archaeological District at Pali Kilo that have been determined eligible for the National Register of Historic Places (NRHP) under Criteria A (American history) and C (architecture). The NHL possesses exceptional significance. A National Historic Landmark represents an outstanding aspect of American history and culture and is the highest level of designation bestowed on a historic property. Hangars 2 and 3 were built in 1941, and the three ancillary Aircraft Spares Storage buildings (Facilities 159,160, 161) were built in 1942. They are contributing resources to the NAS Kaneohe Historic Aviation District [see enclosure 5 for the table: Summary of Historic Properties within the APE].

Archaeology

Archaeological evidence indicates people were present on Mōkapu Peninsula at least 500 to 800 years before Western Contact (Tomonari and Clark-Tuggle 2021:III-15). Thirty-one (31) archaeological sites fall at least partially within this project's APE. Twenty-six (26) of these sites (50-80-11-365, -367, -2883, -2884, -4453, -4610, -4611, -4612, -4613, -4614, -4615, -4616, -4617, -4618, -4619, -4620, -4622, -4623, -4624, -4625, -4933, -5733, -5829, -7722, -7724, and -7725) have been evaluated as eligible for listing on the National Register of Historic Places (NRHP). Site -7726 was evaluated as not eligible. The remaining four (4) sites (50-80-11-4621, -5968, -5969, and -7723) have not been evaluated. Additionally, the Mōkapu Burial Area (50-80-11-1017) is approximately 60 meters (m) to the east, and outside of, the APE and is listed on the NRHP. These archaeological resources are listed in the following table at enclosure 6: Summary of Archaeological Sites within the APE.

The archaeological sites previously documented within this project's APE can be divided into three primary temporal categories: traditional Hawaiian, non-military historic, and military. Most sites within the APE are traditional Hawaiian in association, including six (6) surface sites (50-80-11-365, -367, -4616, -4619, -4620, and -4622) and nine (9) subsurface sites (50-80-11-1017, -2883, -4453, -4933, -5733, -5829, -7722, -7723, and -7724). Eleven (11) sites (50-80-11-4610, -4611, -4612, -4613, -4614, -4617, -4618, -4624, -4625, -5968, and -7725) are associated with non-military historical activities. Finally, five (5) are WWII-era military sites (50-80-11-2884, -4615, -4623, -5969, and -7726). Known sites within 100 meters of proposed project elements are described in further detail below.

The potential for this project's ground-disturbing activities to create impacts to documented and undocumented archaeological sites within the APE varies significantly by area [specific archaeological site locations are shown at enclosure 7]. Large portions along the western and southern edges of the APE are entirely made up of imported fill material placed atop marine sediments during mid-20th-century land reclamation and have no sensitivity for archaeology remains. Parts of the APE within the former original extents (pre-land reclamation) of Mōkapu Peninsula range from low to high sensitivity for archaeological remains, with the highest sensitivity areas on and north of Pali Kilo and near the former estuary along the Kāne'ōhe Bay coast. In

the latter area, fill often overlies intact natural sediments, including archaeological deposits. In the northernmost portion of the APE, land modification has been less intensive, and both surface and subsurface archaeological remains are possible.

Site 50-80-11-0365 is the location of a former *heiau* and St. Catherine's Catholic Church on the southern slope of Keawanui Hill, near a proposed location for Project Element 9 (Ground Data Terminals). The precise location of the *heiau* is undetermined, but O'Day (2007) suggests that Sites -4619, -4620, and -4622 could define two sides of *heiau*; contributes to Mōkapu House Lots Archaeological District at Pali Kilo. The site has been evaluated as eligible for listing on the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021). It is expected that the footprint of the Ground Data Terminal (GDT) will be small and have little to no effect on the surrounding sites.

Site 50-80-11-2884 is a complex of four WWII-era foundations located on the lower slope of Keawanui Hill, approximately 85 meters southwest of a proposed location of Project Element 9 (Ground Data Terminals). The site was originally identified by Tuggle and Hommon (1986). The foundations are likely the remains of houses or storage facilities. The site was recommended eligible for the NRHP under Criterion D (Drolet et al 1996). As Project Element 9 will not occur within the site boundaries, no potential impacts are anticipated.

Site 50-80-11-4453 is a subsurface traditional Hawaiian cultural deposit located west of Hangar 105, near or within the location of Project Element 4 (installation of tie-downs and striping). This site is known to have been used for traditional Hawaiian activities, and contains archaeological features and artifacts indicative of pre-Contact habitation and marine exploitation (Charvet-Pond and Rosendahl 1992b:ii). Site 04453 yielded the earliest radiocarbon date for human occupation on the peninsula, A.D. 1037-1309 (calibrated to 2 sigma; Tomonari-Tuggle and Clark 2021:II-15). Additionally, human remains have been previously documented in the site (Charvet-Pond and Rosendahl 1992b). The site was recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021). Previous documentation of the deposit indicates it underlies coral fill layers that extend 1+ meters below the present surface. The anticipated depth of ground disturbance associated with the installation of tie-downs is not expected to exceed 18 inches (46 cm). It is only expected that the project will affect the site if ground disturbance extends below the coral fill layers.

Sites 50-80-11-4619, -4620, and -4622 are a group of traditional Hawaiian features consisting of a pavement with 2 waterworn uprights, a circular enclosure, and rock and coral piles. The sites are located on the upper slope of Keawanui Hill within 10-25 meters of a proposed location for Project Element 9 (Ground Data Terminals). All three sites may be remnants of the former *heiau* that once stood at the top of the hill (O'Day 2007). The sites were recommended eligible for the NRHP under Criterion C (-4619) and D (-4619, -4620, -4622; Tomonari-Tuggle and Clark 2021). It is expected that the footprint of the Ground Data Terminal will be small and have little to no effect on the surrounding sites.

Site 50-80-11-4623 is a C-shaped structure with corrugated tin and glass bottles on the surface located downslope, approximately 60 meters south of a proposed location for Project Element 9 (Ground Data Terminals). The site was recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and

Clark 2021). As Project Element 9 will not occur within the boundaries of this site, no potential impacts are anticipated.

Site 50-80-11-4933 is a buried traditional Hawaiian occupation deposit located partially beneath Charlie Ramp where Project Element 1 (ramp restriping) will occur. The deposit formed atop a sand berm separating estuaries along the peninsula's pre-land reclamation southwest shoreline, and contains traditional Hawaiian features, artifacts, and cultural materials. Schilz and Allen (1996) initially identified the site, which consists of two stratified archaeological layers. These are charcoal-stained sands with faunal remains and artifacts. Radiocarbon dating suggests occupation occurred sometime during the late 17th century or later. Intact burials and isolated skeletal remains in disturbed contexts have been documented in the site. The site was recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021). The restriping of Charlie Ramp is not expected to involve ground disturbance.

NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT (NAGPRA)

If Native American Graves Protection and Repatriation Act (NAGPRA) cultural items including human remains are encountered during any ground disturbing activities associated with this undertaking, all work shall stop, the finds will be secured and protected, and treatment will proceed under the authority of NAGPRA. As a best management practice under NAGPRA, and as stated above, all ground disturbing activity will be monitored by a qualified archaeologist.

PUBLIC INVOLVEMENT

MCBH will make this information available to the public, in order to provide an opportunity to express their views on resolving adverse effects of the undertaking pursuant to Section 106 Implementing Regulations at 36 CFR 800.6(a)(4). We will consider such views in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, confidentiality concerns, and the relationship of the Federal involvement to the undertaking. Such notice will be made available to the public via the MCBH public website.

DETERMINATION OF EFFECT

MCBH has determined the proposed undertaking will result in adverse effects on historic properties in accordance with the Section 106 Implementing Regulations at 36 CFR 800.5(a)(1) based on the following: 1) demolition of Hangar 3, which is eligible for the National Register as a contributing element of the NAS Kaneohe Historic Aviation District; and (2) demolition of Facilities 159, 160 and 161, which are small Aircraft Spares Storage Buildings located adjacent to Hangar 3 and contributing resources to the NAS Kaneohe Historic Aviation District. MCBH also has determined the proposed undertaking may potentially result in an adverse effect on historic properties based on installing tie-downs west of Hangar 5, which is in the vicinity of NHRP-eligible Site 4453 archaeological deposits.

MCBH is forwarding copies of this letter to the consulting parties listed below, including Native Hawaiian Organizations (NHOs), and in accordance with Section 106 Implementing Regulations at 36 CFR 800.6(a) and will consult with

the SHPO and the consulting parties listed below to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic properties. MCBH will also notify the Advisory Council on Historic Preservation (ACHP) of this adverse effect finding to determine its participation in this consultation, pursuant to Section 106 Implementing Regulations at 36 CFR 800.6(a)(1).

CONSULTATION MEETING

MCBH will hold a virtual meeting [via Webex or teleconference] on Thursday, 13 January 2022, at 9:00 a.m. (HT) to discuss the project and the eventual development of a memorandum of agreement (MOA) to resolve the adverse effects described above. We will provide instructions for joining the call closer to the date of the meeting.

Should you or your staff have any questions, please contact the MCBH Cultural Resources Management staff, Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil, or Dr. Wendy Wichman at 257-7134 or via email at wendy.wichman@usmc.mil.

Sincerely,

HART.JEFFRY.
P.1242350568

Digitally signed by
HART.JEFFRY.P.1242350568
Date: 2022.01.07 14:07:06
-10'00'

J. P. HART
Major, U. S. Marine Corps
Director, Environmental Compliance and
Protection Division
By direction of the Commanding Officer

- Enclosures:
1. Map: Location map showing the general location of the Home Basing of the MQ-9A & KC-130J Squadrons project
 2. Table: Project Elements for the Home Basing of the MQ-9A & KC-130J Squadrons
 3. Map: Project Elements for the Home Basing of the MQ-9A & KC-130J Squadrons
 4. Map: Proposed APE for the Home Basing of the MQ-9A & KC-130J Squadrons
 5. Table: Summary of Historic Properties within the APE for the Home Basing of the MQ-9A & KC-130J Squadrons
 6. Table: Summary of Archaeological Sites within the APE for the Home Basing of the MQ-9A & KC-130J Squadrons
 7. Map: Archaeological Sites within and Near the APE for the Home Basing of the MQ-9A & KC-130J Squadrons

Copy to:

Elaine Jackson-Retondo, Preservation Partnerships & History, National Park Service
Chair, Oahu Island Burial Council (via Regina Hilo, SHPD)
Chair, Office of Hawaiian Affairs
Ms. Anuheia Diamond, Diamond `Ohana
Ms. Skye Razon-Olds, Olds `Ohana
Ms. Emalia Keohokalole, Keohokalole ``Ohana
Mr. Norman Llanos, Prince Kuhio Hawaiian CC
Ms. Na`u Kamali`i, Boyd `Ohana
Ms. Donna Ann Camvel, Paoa Kea Lono `Ohana
Mr. Cy Harris, Kekumano `Ohana
Ms. Terrilee Napua Keko`olani Raymond, Keko`olani `Ohana
Ms. Cathleen Mattoon, Koolauloa Hawaiian Civic Club
Mr. Clive Cabral, Temple of Lono
Ms. Kaleo Paik, Paik `Ohana
Ms. Kiersten Faulkner, Historic Hawaii Foundation
Ms. Elizabeth Merritt, National Trust for Historic Preservation

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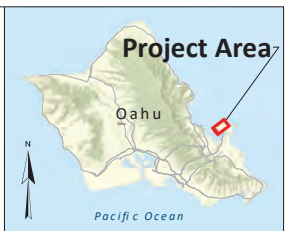
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Enclosure 1: Project Area

Legend

- Building
- Paved Area
- Road

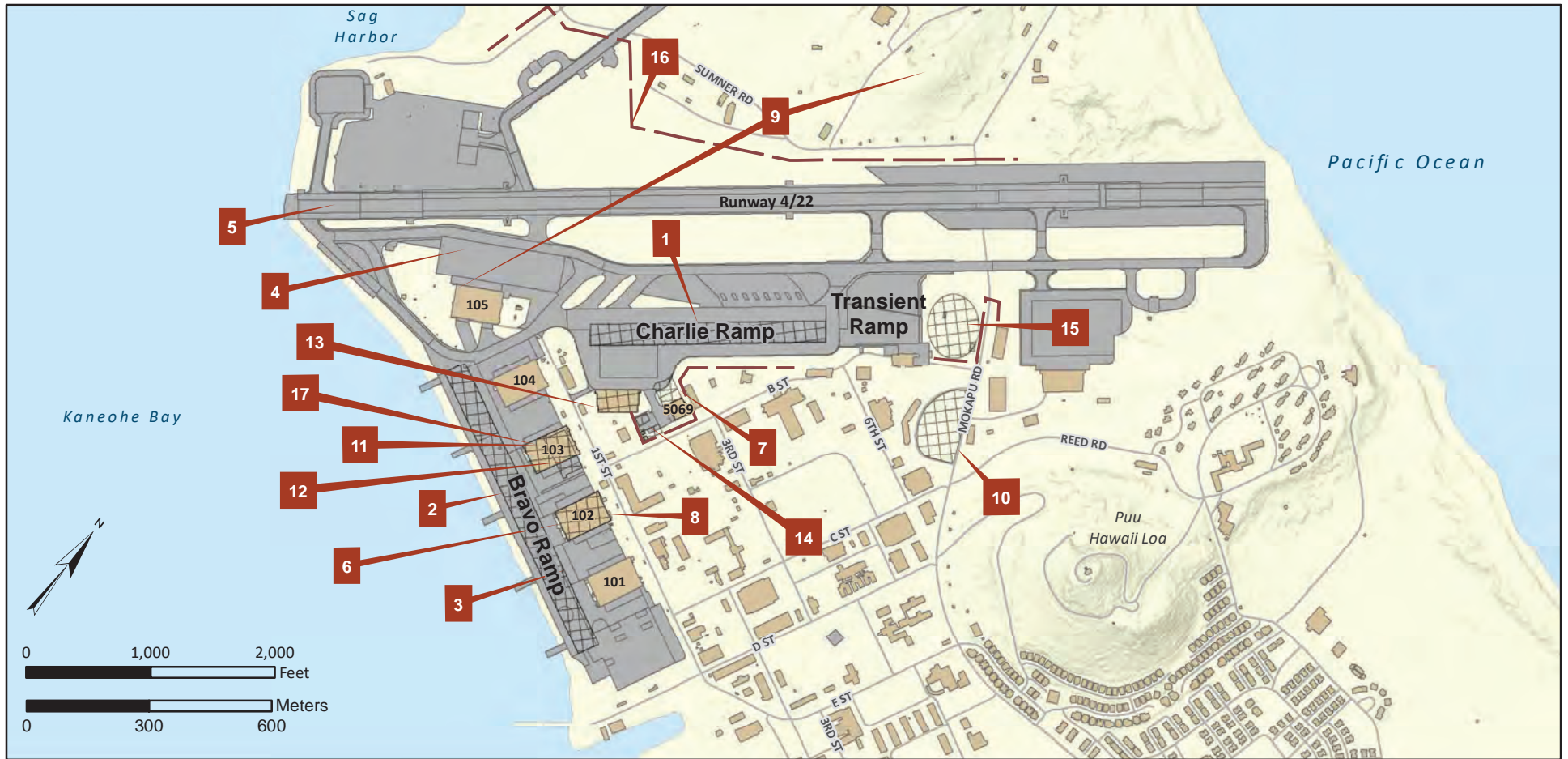


Sources: Esri, 2021; Hawaii Statewide GIS, 2021; MCBH, 2021

ENCLOSURE 2: PROJECT ELEMENTS FOR THE HOME BASING OF THE MQ-9A & KC-130J SQUADRONS - JANUARY 2022

Project Task		Description	Location	FY	
Charlie Ramp Upgrades					
1	Restriping of Charlie Ramp	Restriping	Area west of Hangar 6886; east of Taxiway A where C-130 parking apron project is currently.	TBD	
Hangar 2 Renovations and Infrastructure Improvements for MQ-9					
3	Tie-downs at Bravo Taxi Ramp and Bravo-1.	Install tie-downs at Taxiway Bravo and Bravo-1	Bravo Ramp	FY23	
4	Tie-downs and striping at end of Runway 4/22, west of Hangar 105 (Hangar 5)	Tie-downs near Hangar 105 and striping.	Near end of Runway 4/22; west of Hangar 105	FY22	
6	Hangar 102 modifications to accommodate MQ-9A	Hangar 102 will house the MQ-9 aircraft and squadron personnel. Minimal renovations to support the MQ-9 aircraft and operation include: <ul style="list-style-type: none"> • Interior upgrades: electrical, mechanical and communication systems. • Install new training simulator 	Hangar 102	FY22	
8	Two Ground Control Stations (GCSs) with Environmental Control Units (ECUs)	Mobile GCS with ECUs	Hangar 102	FY22	
9	Two Ground Data Terminals (GDTs)	Two GDTs will be temporarily installed on top of Keawanui Hill (115 feet). Vegetation will be cleared, and temporary construction mats installed for the GDTs and a back-up generator. Power will be supplied through the existing overhead electrical line. GDTs will be tied down using stakes and/or 5,000-lbs. concrete blocks.	<ul style="list-style-type: none"> • Keawanui Hill • Adjacent to Hangar 105 	FY22	
Replace Hangar 3 & Bravo Ramp Upgrades					
2, 5	Resurfacing, repaving, and striping of Bravo Ramp	Repave and restripe for 10 MV-22 aircraft Taxiways B and T need asphalt replacement	Bravo Ramp Bay side of Hangars 2-4 Taxiway B provides access from Taxiway A to the Bravo Ramp. Taxiway T provides access from Taxiway A to the Charlie Ramp.	FY23	

11	Demolish Hangar 103	Demolition of Hangar 3 (Facility 103)	Existing Hangar 3 (Facility 103)	FY25	
17	Demolish 159, 160, 161	Demolition of Aircraft Spares Storage buildings (Facilities 159-161)	Adjacent to Hangar 3 (Facility 103)		
12	Construct new Type II Hangar 103 maintenance hangar for MV-22s	New Type II hangar similar to new MV-22 hangar (6886). Design guidelines will be developed as part of MOA during Section 106 Consultation.	Existing Hangar 3 (Facility 103)	FY25	
P-876 Airfield Security Fencing					
16	New Fencing	For the Level Two Restricted Area boundary perimeter security requirements for Bravo Ramp and Charlie Ramp. Discontinuous sections of fencing need to be filled in along with access control points and signage. The fence will limit access to the airfield.	Near existing aviation facilities along the Bravo Ramp, Charlie Ramp, Transient Ramp and in West Field.	FY24	
Hangar 6886 Associated Work					
7	Construct KC-130J wash rack	Type L wash rack with permanent scaffolding for personnel to safely wash the aircraft. A new tow way will provide access from Charlie Ramp to the wash rack. The Type L wash rack is required for the fixed-wing aircraft (KC-130J, P-8A, C-40, and C-20). The MQ-9 does not require a wash rack.	Wash Rack has been preliminarily located at the former corrosion control hangar (Facility 5069) site after it is demolished.	TBD	
13	Reconfigure Hangar 6886 interior spaces to convert from MV-22 to KC-130J use.	Reconfiguration of interior spaces to meet the needs of the squadron	Hangar 6886	TBD	
14	Construct new support facilities at Hangar 6886	Storage Facility Propeller Maintenance Facility	The project is currently under development	TBD	
Refuel Pit					
15	Demolish Facilities 4000 and 5068 and construct new Hot Refuel Pit, including lines from fuel farm and drainage system.	Installation of a new refuel pit (aircraft direct-fueling station) and new pipelines that will run from Fuel Farm. G-3 Storage building (Facility 4000), built in 1986 and the Aircraft Rescue Halon Reclaim Building (Facility 5068), built in 1991 are not historic.	Adjacent to the Transient Ramp. No confirmed utilities location.	FY26	
Construction Laydown					
10	Construction laydown and staging area at Crescent Circle	Potential construction laydown area. To be confirmed at later date.	Crescent Circle area behind MCAS Terminal Building. South side of Mokapu Road in the "Green Field" site.	TBD	



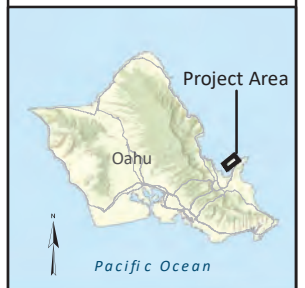
Enclosure 3: Project Elements

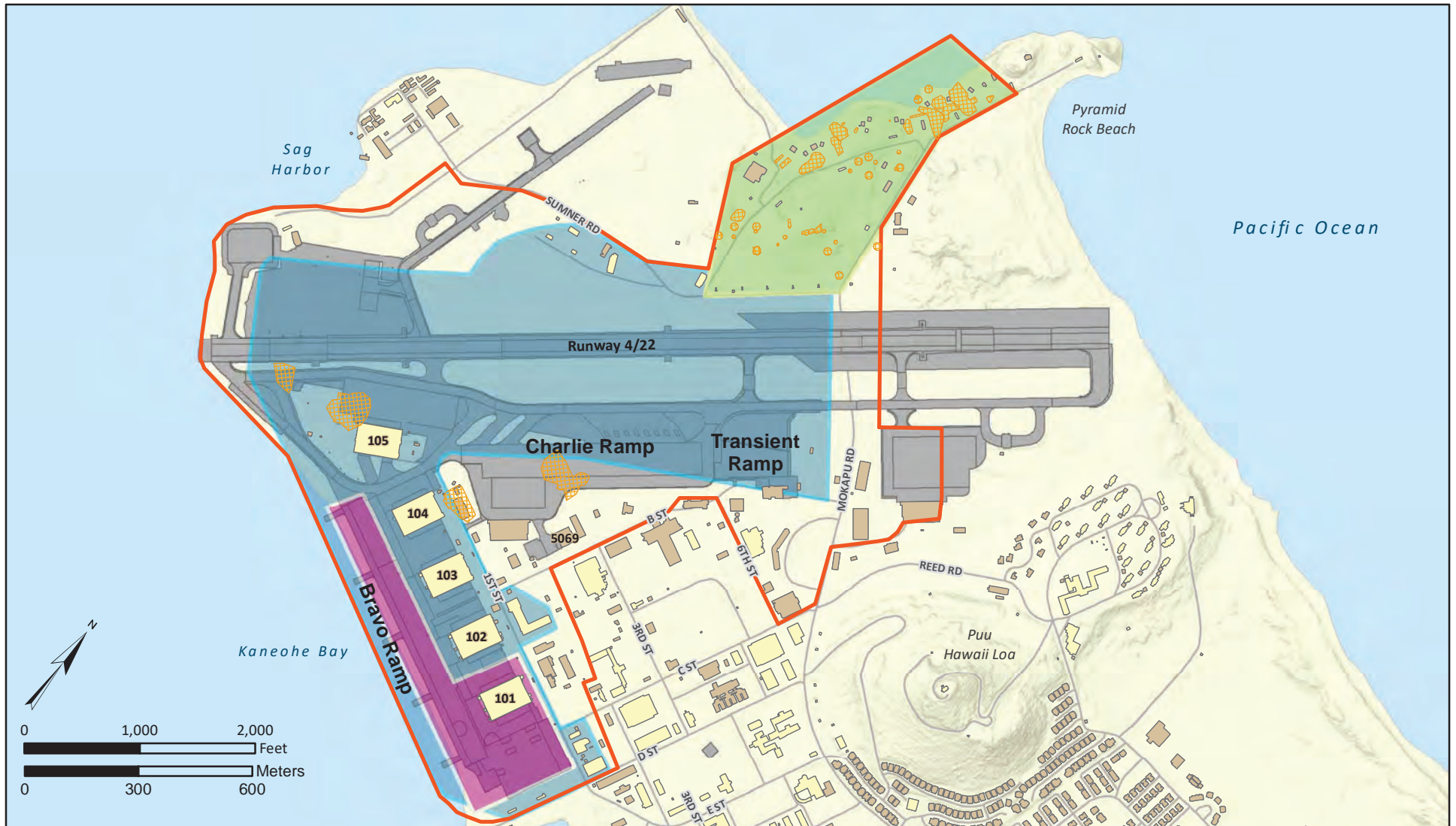
Index

- | | |
|---|--|
| <ul style="list-style-type: none"> (1) Restripe Charlie Ramp (2) Resurface, repave, and stripe Bravo Ramp (3) Install tie-downs at Bravo Taxi Ramp and Bravo-1 (4) Install tie-downs at and stripe end of Runway 4/22, west of Hangar 105 (5) Replace taxiway asphalt (6) Modify Hangar 102 to accommodate MQ-9A:
-Interior upgrades: electrical, mechanical and communication systems
-Training simulator (7) Construct a KC-130J wash rack (8) Install two Ground Control Stations (GCSs) with Environmental Control Units (ECUs) at Hangar 102 (9) Install two Ground Data Terminals (GDTs):
-Keawanui Hill
-Adjacent to Hangar 105 | <ul style="list-style-type: none"> (10) Construct laydown and staging area at Crescent Circle (11) Demolish Hangar 103 (12) Construct Type II Hangar 103 aircraft maintenance hangar for MV-22s (13) Reconfigure Hangar 6886 interior spaces from MV-22 to KC-130J use (14) Construct new support facilities adjacent to Hangar 6886:
-Storage Facility
-Propeller Maintenance Facility (15) Construct new Hot Refuel Pit and demolish Buildings 4000 and 5068 (16) Construct new Security Fencing (17) Demolish Buildings 159, 160, and 161 |
|---|--|

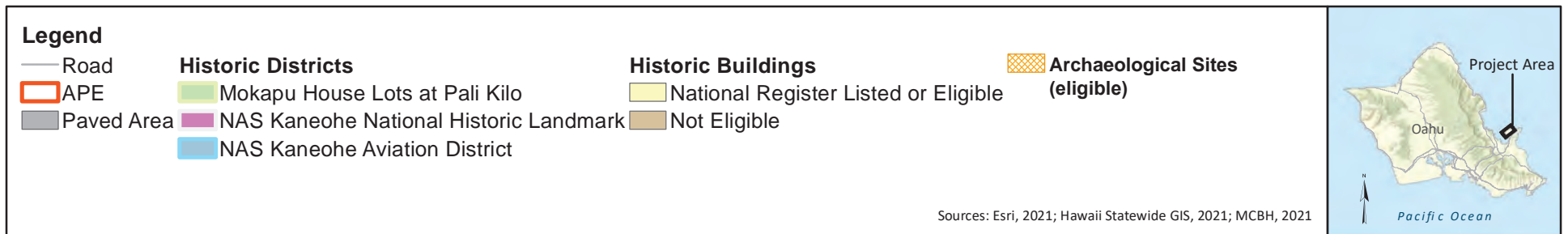
Legend

- Proposed Fencing
- Proposed Project Area
- Paved Area
- Building
- Road














Enclosure 4: Area of Potential Effect










Enclosure 5: Summary of Historic Properties within the APE for the Home Basing of the MQ-9A & KC-130J Squadrons





Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
NHL and Aviation District			
Seaplane Ramps (5) Facilities 1-5	1940	Contributing resource to the <i>Kaneohe Naval Air Station National Historic Landmark District</i> and the Aviation District. Existed at the time of the 7 December 1941 attack and came under fire during the attack. Part of the 1939 initial proposed base layout and were critical to the primary purpose and mission of the original base.	
Maintenance Hangar 1 Facility 101	1941	Contributing resource to the <i>Kaneohe Naval Air Station National Historic Landmark District</i> and the Aviation District. Existed at the time of the 7 December 1941 attack. Bombed and strafed during the attack. As with its neighbor hangars, the building is a visual defining element of Main Base and dominates the landscape when viewed from public vantage points and within the aviation area. Designed by Albert Kahn, Inc.	
Bravo Ramp No Facility #	1939	Contributing resource to the <i>Kaneohe Naval Air Station National Historic Landmark District</i> and the Aviation District. One of the primary targets of the 7 December 1941 Japanese attack. Strafing marks from the attack remain.	





Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Aviation District			
Maintenance Hangar 2 Facility 102	1939/ 1941	Contributing resource to the Aviation District. One of the first structures built on the NAS (original 1939 portion). Existed at the time of the 7 December 1941 attack. Mostly undamaged by surrounding bombing and strafing during the attack. As with its neighbor hangars, the building is a visual defining element of Main Base and dominates the landscape when viewed from public vantage points and within the aviation area. Designed by Albert Kahn, Inc.	
Maintenance Hangar 3 Facility 103	1941	Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Undamaged by surrounding bombing and strafing during the attack. As with its neighbor hangars, the building is a visual defining element of Main Base and dominates the landscape when viewed from public vantage points and within the aviation area. Designed by Albert Kahn, Inc.	





Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Aviation District			
Maintenance Hangar 4 Facility 104	1941	Contributing resource to the Aviation District. Under construction at the time of the 7 December 1941 attack. Undamaged by surrounding bombing and strafing during the attack. As with its neighbor hangars, the building is a visual defining element of Main Base and dominates the landscape when viewed from public vantage points and within the aviation area. Designed by Albert Kahn, Inc.	
Maintenance Hangar 5 Facility 105	1943	Contributing resource to the Aviation District. Built as a land plane hangar during World War II. As with its neighbor hangars, the building is a visual defining element of Main Base and dominates the landscape when viewed from public vantage points and within the aviation area. Designed by Albert Kahn, Inc.	
MWR Storage Facilities 106, 120, 610	1942	Contributing resources to the Aviation District. Part of World War II base build-up. A group of identical concrete buildings, originally built as torpedo storehouses	
Aircraft Spares Storage Facilities 159-163, 166-168, 170, 183, 184, 187-196	1942-1943	Contributing resources to the Aviation District. Part of World War II base build-up. Concrete hangar support building located primarily near Hangars 1-3. Originally stored aircraft armament and supplies	

Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Shop Maintenance Elect-Refrig/ Public Works Shop Facility 201	1941	Former Utilities Shop and Parachute Loft Stowage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. One of three associated early base support buildings (with Facilities 202 and 203). Part of the 1939 initial proposed base layout. Designed by Albert Kahn, Inc.	
Shop, Maintenance Machine/Public Works Shop Facility 202	1941	Former Torpedo Workshop Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. One of three associated early base support buildings (with Facilities 201 and 203). Part of the 1939 initial proposed base layout. Designed by Albert Kahn, Inc.	
Public Works Shop, Grounds/Jan/Pest Cont/Public Works Shop Facility 203	1941	Former Bombsight Workshop and Storage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. One of three associated early base support buildings (with Facilities 201 and 202). Part of the 1939 initial proposed base layout. Designed by Albert Kahn, Inc.	

Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
		Aviation District	
MAG HQS/Photo Lab/ Academic Classroom Facility 301	1941	Former Squadron Offices and Storage Building. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Part of the 1939 initial proposed base layout. Designed by Albert Kahn, Inc.	
Pump Houses Facilities 302 and 155	1941 and 1943	Concrete sump houses structures. Contributing resources to the Aviation District. Facility 302 existed at the time of the 7 December 1941 attack and was part of the 1939 initial proposed base layout.	
General Warehouse Facility 601	1941	Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Matching concrete Buildings 601 and 602 were originally used to store smoke drums.	
General Warehouse Facility 602	1942	Contributing resource to the Aviation District. Part of World War II base buildup. Matching concrete Buildings 601 and 602 were originally used to store smoke drums.	

Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Aviation District			
Storehouse Ordnance/Inert Storehouse Facility 603	1941	Former Small Arms Magazine and Inert Storehouse. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Early base support structure originally used for arms storage.	
Ordnance Operations Building Facility 605	1941	Former Small Arms Magazine and Inert Storehouse. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Early base support structure originally used for arms storage.	
Aircraft Recovery Operations Ground Support Equipment Shop Facility 620	1945	Last extant Quonset intact hut. Former Aircraft Engine Salvage Shop. Contributing resource to the Aviation District.	
Community Storage Facilities 708-712	1942	Underground Structures. Five former Fuse and Detonator Magazines. Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack.	

Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Pali Kilo			
Community Storage Facilities 701-707	1942	Storage magazines. Identical, historic World War II-period earth-sheltered munitions magazines located along the roads throughout the Pali Kilo area.	
Flammables Storehouse Facility 995	1942	The, built as a paint locker. The structure is a good example of cast concrete splinter-proof construction. Individually eligible for the NRHP.	
Historic Buildings in APE But Not Within a District			
Auto Vehicle Shop Facility 351	1941	WWII wood-framed base support building. Part of a grouping of three historic auto repair buildings (Facilities 351, 377, and 399). Individually eligible for the NRHP.	
Transportation Office Facility 352	1942	WWII wood-framed base support building adjacent to the auto shop group of buildings. One of the last remaining buildings of its type at the base, it is eligible for the NRHP.	

Summary of Historic Properties within APE			
Name/Facility #	Year Built	Evaluation of Significance	Photo
Historic Buildings in APE But Not Within a District			
Accessory Overhaul Building Facility 374	1943	Part of World War II base expansion in Hawai'i. A one-story concrete building with a small second-story mezzanine. Built as part of the Assembly and Repair Department for aircraft. Individually eligible for the NRHP.	
Assembly and Repair Shop Hangar Facility 375	1944	Repair shop hangar built as part of WW II base expansion in Hawai'i. Part of the aircraft Assembly and Repair Department. Individually eligible for the NRHP.	
Garage/Auto Repair Facility 377	1945	WWII wood-framed base support building. Part of a grouping of three historic auto repair buildings (Facilities 351, 377, and 399). Individually eligible for the NRHP.	
Auto Vehicle Shop Facility 399	1945	WWII wood-framed base support building. Part of a grouping of three historic auto repair buildings (Facilities 351, 377, and 399). Individually eligible for the NRHP.	
		End.	

Enclosure 6: Summary of Archaeological Sites within or near the APE for the Home Basing of the MQ-9A & KC-130J Squadrons

SIHP Site No. 50-80-11-	District/ Area	Period	Site Description ^a	NRHP Status (Significance Criterion)	References
365	MHLAD; MPPA (Proposed) ^b	TH	<i>Heiau</i> ; on southern slope of Keawanui; location of St. Catherine's Catholic Church in 1840s; O'Day 2007 suggests that Sites 4619, 4620, 4622, and Temp Site 1 could define two sides of <i>heiau</i>	NRE-yes (D)	Thrum 1915; MacCaughey 1917; McAllister 1933; Ruzicka and O'Day 2005; O'Day 2007; Nickelsen and Kirkendall 2008a
367	MHLAD; MPAA (Proposed)	TH	Hina Stone; elongated waterworn boulder; one of three features including a fishing shrine with two uprights representing Kane and Kanaloa, a fish trap (Pa Ohua), and shrine with two stones representing Ku and Hina; damaged in 2009	NRE-yes (B, C, D)	MacCaughey 1917; McAllister 1933; Drolet et al. 1996; Schilz et al. 1996; Ruzicka and O'Day 2005; Nickelsen and Kirkendall 2008b
1017	--	TH	Mōkapu Burial Area	NRL (C, D)	Bowles 1940; Bowen 1961, 1974; NRHP 1972; Snow 1974; Barrera 1982; Athens 1985; Cleghorn 1987; Charvet-Pond and Rosendahl 1992a, 1992b, 1992d; Anderson 1997; Collins et al. 1994; Schilz and Allen 1996; Williams and Patolo 1998; Tuggle 1999, 2000, 2002a, 2002b; Prishmont and Anderson 2000; Gosser and Riford 2005; Morrison et al. 2010
2883	MHLAD; MPAA (Proposed)	TH; NM	Subsurface cultural deposits from pre- and post-Contact periods and pre-WWII house sites; pre-Contact deposit possibly continuous with 5733	NRE-yes (D)	Barrera 1982; Tuggle and Hommon 1986; Drolet et al. 1996; Anderson 1998; Ruzicka and O'Day 2005; O'Day 2007; Nickelsen and Kirkendall 2008c
2884	--	M	Four concrete house foundations, ca. WWII	NRE-yes (not given)	Tuggle and Hommon 1986; Drolet et al. 1996; Prishmont et al. 2001

SIHP Site No. 50-80-11-	District/ Area	Period	Site Description ^a	NRHP Status (Significance Criterion)	References
4453	MPAA (Proposed)	TH	Subsurface cultural deposit with pit features, postmolds, shell midden, charcoal; intact burials	NRE-yes (D)	Charvet-Pond and Rosendahl 1992c, 1992e; Prishmont and Anderson 2000; Prishmont et al. 2001; Gosser et al. 2002; Rasmussen 2007; Nickelsen and Kirkendall 2008d; Filimoehala et al. in prep.
4610	MHLAD	NM	House terrace/complex	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; Gosser et al. 2015
4611	MHLAD	NM	House site; pre-WWII	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005
4612	MHLAD	NM	House site; pre-WWII to 1943	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; Allen 2013
4613	--	NM	Stone wall and historic walkway	NRE-yes (D)	Drolet et al. al 1996; Allen 2013
4614	MHLAD	NM	House site; pre-WWII	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; Allen 2013
4615	--	M	Underground storage room; exterior door labelled "Paint Locker"; probable post-WWII	NRE-yes (not given)	Drolet et al. al 1996; Allen 2013
4616	MPAA (Proposed)	TH	Low basalt cobble and boulder wall	NRE-yes (D)	Drolet et al. 1996; Nickelsen and Kirkendall 2008e
4617	MHLAD	NM	House site; pre-WWII	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005
4618	MHLAD	NM	Building cluster; pre-WWII	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005
4619	MHLAD; MPAA (Proposed)	TH	Pavement w/ 2 waterworn uprights; on slope of Keawanui Hill; may be	NRE-yes (C, D)	Nickelsen and Kirkendall 2008f; Ruzicka and O'Day 2005
4620	MHLAD	TH	Enclosure; circular; on upper east facing slope of Keawanui Hill; may be part of Site 365 <i>heiau</i>	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; O'Day 2007; Nickelsen and Kirkendall 2008g
4621	--	NM	Building foundation	n/a	Drolet et al. 1996
4622	MHLAD; MPAA (Proposed)	TH	Rock and coral piles; may be part of Site 365 <i>heiau</i>	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; O'Day 2007; Nickelsen and Kirkendall 2008h

SIHP Site No. 50-80-11-	District/ Area	Period	Site Description ^a	NRHP Status (Significance Criterion)	References
4623	MPAA (Proposed)	M	C-shaped structure; corrugated tin and glass bottles on surface; probable military	NRE-yes (D)	Drolet et al. 1996; Ruzicka and O'Day 2005; O'Day 2007; Nickelsen and Kirkendall 2008i; Allen 2013
4624	MPAA (Proposed)	NM	Enclosure; low walls, rectangular, 11 x 7 m; concrete slab fragment on surface; probably historic-period house	NRE-yes (D)	Drolet et al. 1996; O'Day 2007; Nickelsen and Kirkendall 2008j; Allen 2013
4625	MHLAD	NM	House site; pre-WWII	NRE-yes (D)	Ruzicka and O'Day 2005
4891	MPAA (Proposed)	TH	Subsurface cultural deposit; 6 features w/ cultural material; south of Pyramid Rock	NRE-yes (D)	Nickelsen and Kirkendall 2008k
4933	MPAA (Proposed)	TH	Subsurface cultural deposit with pits, postholes, firepits; bone arrow point	NRE-yes (D)	Schilz and Allen 1996; Rechtman and Wolforth 2000; Allen 2000; Prishmont et al. 2001; Gosser et al. 2002; Nickelsen and Kirkendall 2008l
5733	MPAA (Proposed)	TH; NM	Subsurface cultural deposits; traditional Hawaiian and 19th century; 20th century house and yard; in dune on west-facing slope of Pali Kilo	NRE-yes (D)	Rosendahl 1999; O'Day 2007; Nickelsen and Kirkendall 2008m; Gosser et al. 2015
5829	MPAA (Proposed)	TH	Subsurface cultural deposit, burials; around Building 6470, north of Hangar 104	NRE-yes (D)	Prishmont et al. 2001; Roberts et al. 2002; Dixon et al. 2002; Nickelsen and Kirkendall 2008n; Allen and Rieth 2014; Allen 2015; Barna et al. 2017
5968	--	NM	Historic basalt retaining wall, possibly associated with the Mokapu Experimental Game farm	TBD	Roberts et al. 2002
5969	--	M	Concrete foundation; immediately west of Keawanui	TBD	Roberts et al. 2002
7722	MHLAD	TH	Subsurface cultural deposit	NRE-yes (C, D)	Gosser et al. 2015
7723	--	TH	Intact but disturbed human burial remains; sparse traditional Hawaiian artifacts	n/a	Gosser et al. 2015

SIHP Site No. 50-80-11-	District/ Area	Period	Site Description ^a	NRHP Status (Significance Criterion)	References
7724	MHLAD	TH	Disturbed subsurface cultural deposit (including one human tooth)	NRE=yes (C, D)	Gosser et al. 2015
7725	MHLAD	NM	Retaining wall	NRE=yes (C, D)	Gosser et al. 2015
7726	--	M	Concrete foundations; WWII-era	NRE=no	Gosser et al. 2015

^a Site descriptions and period designations are reproduced from the updated ICRMP (Tomonari-Tuggle and Clark 2021:Table II-7).

^b MHLAD: Mōkapu House Lots Archaeological District; MPAA (Proposed): Mōkapu Peninsula Archaeological Area (Proposed).

NRE = National Register Eligible; NRL = National Register Listed

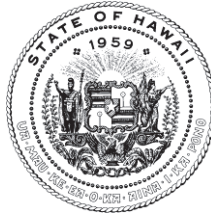
Probable period of use: TH=traditional Hawaiian (pre-Contact/19th Century; NM=non-military; M=military (20th Century)



Enclosure 7: Archaeological Sites Within and Near the APE



DAVID Y. IGE
GOVERNOR OF
HAWAII



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CHAIRPERSON
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
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February 7, 2022

Major J. P. Hart, Director
Environmental Compliance and Protection Department
United States Marine Corps
Marine Corps Base Hawai'i Box 63002
Kaneohe Bay, Hawai'i 96863-3002
Email: Jeffrey.Hart@usmc.mil
Electronic Transmittal Only, No Hard Copy to Follow

IN REPLY REFER TO:
Project No.: 2022PR00034
Doc. No.: 2202SH06
Archaeology
Architecture
History and Culture

Dear Major J. P. Hart:

**SUBJECT: National Historic Preservation Act (NHPA) Section 106 Review –
Initiation of Consultation and Request for Concurrence with the Effect Determination
Proposed MCBH Home Basing of The MQ-9A Unmanned Air System and
KC-130J Aerial Transport Refueling Aircraft Aboard Marine Corps Base Hawai'i
Ref. No. LFE/001-22
He'eia Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-4-008:001**

The State Historic Preservation Division (SHPD) received a letter dated, January 7, 2022 from the Marine Corps Base Hawai'i (MCBH) to initiate the Section 106 consultation process and to request the State Historic Preservation Officer's (SHPO's) concurrence with the effect determination for the MCBH Home Basing of the MQ-9A Unmanned Air System and KC-130J Aerial Transport Refueling Aircraft project at MCBH on the island of O'ahu. The SHPD received this submittal on January 7, 2022. A meeting was held between MCBH, SHPD, and consulting parties on January 13, 2022.

MCBH's letter states the project is centered on the area around Hangars 2 and 3 (Facilities 102 and 103) and includes support areas at Pali Kilo, West Field, Charlie Ramp, Transient Ramp, and Crescent Circle (for construction laydown). The undertaking includes home basing a Marine Corps MQ-9A Extended Range Unmanned Aerial Vehicle (UAV) squadron (6 aircraft) and a KC-130J aircraft squadron (15-aircraft) at MCBH Kaneohe. Each squadron consists of personnel, aircraft, and supporting infrastructure. The MQ-9A squadron will conduct UAV training operations, and the KC-130J squadron will conduct aerial refueling. The proposed action will enable the USMC to meet their Title X requirement to provide, train, and equip forces for the Combatant Commander through increasing the capability, versatility, and range of USMC forces in Hawai'i.

Further, the MCBH Home Basing project will house the MQ-9A squadron in Hangar 102 and house the KC-130J squadron in the hangar currently occupied by the MV-22 squadron (Facility 6886). It will include demolition of Hangar 3 (Facility 103) and ancillary Aircraft Spares Storage Buildings (Facilities 159, 160 and 161) adjacent to Hangar 3 and construction of a new Type II hangar on its footprint to house the MV-22 squadron. The new hangar will have a steel-frame construction with standing seam metal roofing, concrete filled metal deck floors, and a pile foundation. MCBH also proposes to demolish Facilities 4000 (G-3 Storage) constructed in 1986, and 5068 (Aircraft Rescue), built in 1991, located at the Hot Fuel Pit. A list of additional proposed actions is provided with MCBH's letter.

The MCBH has determined the proposed project is a federal undertaking as defined in 36 CFR 800.16(y) and is therefore subject to Section 106 of the National Historic Preservation Act.

The area of potential effects (APE) for this project consists of the Kaneohe Naval Air Station National Historic Landmark District (NHL), the Naval Air Station (NAS) Kaneohe Historic Aviation District (Aviation District), which includes the NHL, Bravo Ramp, Charlie Ramp, Transient Ramp, the Mokapu House Lots Archaeological District at Pali Kilo, portions of the West Field area to the north of the runway, and areas that are adjacent to the Aviation District east of Charlie Ramp and Transient Ramp. Based on information in SHPD's HICRIS system, the APE is approximately 508 acres.

The MCBH states there are approximately 65 architectural resources within the APE, as well as three historic districts which are the Naval Air Station (NAS) Kaneohe Historic Aviation District, the Kaneohe Naval Air Station National Historic Landmark (NHL), and the Mokapu House Lots Archaeological District at Pali Kilo all determined eligible for the National Register of Historic Places (NRHP) under Criteria A (American history) and C (architecture). Hangars 2 and 3 were built in 1941, and the three ancillary Aircraft Spares Storage buildings (Facilities 159,160, 161) were built in 1942. They are contributing resources to the NAS Kaneohe Historic Aviation District. Thirty-one archaeological sites fall at least partially within this project's APE. Twenty-six of these sites have been evaluated as eligible for listing in the NRHP. The remaining four sites have not been evaluated. The Mōkapu Burial Area (50-80-11- 1017) is approximately 60 meters (m) to the east, and outside of, the APE and is listed in the NRHP. MCBH has determined the archaeological sites previously documented within the APE can be divided into three primary temporal categories: traditional Hawaiian, non-military historic, and military; most sites within the APE are traditional Hawaiian in association.

The MCBH has determined the proposed project will result in an *adverse effect* based on 1) demolition of Hangar 3, which is eligible for the National Register as a contributing element of the NAS Kaneohe Historic Aviation District and 2) demolition of Facilities 159, 160 and 161, which are small Aircraft Spares Storage Buildings located adjacent to Hangar 3 and contributing resources to the NAS Kaneohe Historic Aviation District. MCBH also determined the proposed undertaking may potentially result in an *adverse effect* on historic properties based on installing tie-downs west of Hangar 5, which is in the vicinity of NHRP-eligible Site 4453 archaeological deposits. The SHPO agrees with the basis for a determination of *adverse effect* but opines MCBH must still take into consideration comments received from the public and interested parties, which may result in the identification of additional historic properties and/or raise additional concerns regarding project impacts prior to the SHPO's concurrence and drafting of a Memorandum of Agreement to address the identified effects.

Please provide a determination of availability for the four archaeological sites identified and an assessment of the projects potential impact to those sites. **Please also provide** copies, or a summary of, responses received from the public and consulting parties to date.

The SHPO looks forward to continuing Section 106 consultation for the proposed project.

The MCBH is the office of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Stephanie Hacker, Historic Preservation Archaeologist IV, at Stephanie.Hacker@hawaii.gov or at (808) 692-8046 for matters regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christopher Frantz, MCBH (christopher.frantz@usmc.mil)
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STATE OF HAWAII
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION-
LAND
STATE PARKS

July 11, 2022

Major J. P. Hart, Director
Environmental Compliance and Protection Department
United States Marine Corps
Marine Corps Base Hawai'i Box 63002
Kaneohe Bay, Hawai'i 96863-3002
Email: Jeffrey.Hart@usmc.mil
Electronic Transmittal Only, No Hard Copy to Follow

IN REPLY REFER TO:
Project No.: 2022PR00034
Doc. No.: 2207SH05
Archaeology
Architecture
History and Culture

Dear Major J. P. Hart:

**SUBJECT: National Historic Preservation Act (NHPA) Section 106 Review –
Draft 1 Memorandum of Agreement
Proposed MCBH Home Basing of the MQ-9A Unmanned Air System and KC-130J Aerial
Transport Refueling Aircraft Aboard Marine Corps Base Hawai'i
He'eia Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-4-008:001**

The State Historic Preservation Division (SHPD) received a draft Memorandum of Agreement (MOA) titled, *Memorandum of Agreement (MOA) between Marine Corps Base Hawaii (MCBH) and the Hawaii State Historic Preservation Officer (SHPO) Regarding the Home Basing of the MQ-9 Unmanned Aerial Vehicle Squadron and KC-130J Aerial Refueler Transport Aircraft Squadron at Marine Corps Base Hawaii, Kaneohe Bay*, from the Marine Corps Base Hawai'i (MCBH) to continue the Section 106 consultation process and determine appropriate methods to avoid, minimize, and mitigate adverse effects to historic properties resulting from the MCBH Home Basing of the MQ-9A Unmanned Air System and KC-130J Aerial Transport Refueling Aircraft project at MCBH on the island of O'ahu. The SHPD received this submittal via email on July 4, 2022 (email Correspondence; June Cleghorn [MCBH] to SHPD) and via the SHPD HICRIS on July 11, 2022 (HICRIS Submission No. 2022PR00034.002).

The MCBH has determined the proposed project is a federal undertaking as defined in 36 CFR 800.16(y); the project is therefore subject to Section 106 of the National Historic Preservation Act. The MCBH initiated Section 106 consultation with the SHPO on January 7, 2022 (MCBH Ref. No. LFE/001-22; SHPD HICRIS Submission No. 2022PR00034.001). A Section 106 meeting for the proposed project was held among MCBH, SHPD, and consulting parties on January 13, 2022 and March 10, 2022.

MCBH's January 2022 letter stated the project is centered on the area around Hangars 2 and 3 (Facilities 102 and 103) and includes support areas at Pali Kilo, West Field, Charlie Ramp, Transient Ramp, and Crescent Circle (for construction laydown). The undertaking includes home basing a Marine Corps MQ-9A Extended Range Unmanned Aerial Vehicle (UAV) squadron (6 aircraft) and a KC-130J aircraft squadron (15-aircraft) at MCBH Kaneohe. Each squadron consists of personnel, aircraft, and supporting infrastructure. The MQ-9A squadron will conduct UAV training operations, and the KC-130J squadron will conduct aerial refueling.

The MCBH Home Basing project will house the MQ-9A squadron in Hangar 102 and house the KC-130J squadron in the hangar currently occupied by the MV-22 squadron (Facility 6886). It will include demolition of Hangar 3 (Facility 103) and of the ancillary Aircraft Spares Storage Buildings (Facilities 159, 160 and 161) adjacent to

Hangar 3. The project also includes construction of a new Type II hangar in the Hangar 3 footprint to house the MV-22 squadron.

The new Type II hangar will be a steel-frame construction with standing seam metal roofing, concrete filled metal deck floors, and a pile foundation. MCBH also proposes to demolish Facilities 4000 (G-3 Storage) constructed in 1986, and 5068 (Aircraft Rescue) built in 1991, located at the Hot Fuel Pit. A list of additional proposed actions is provided with MCBH's letter.

The area of potential effects (APE) for this project consists of the Kaneohe Naval Air Station National Historic Landmark District (NHL), the Naval Air Station (NAS) Kaneohe Historic Aviation District (Aviation District), Bravo Ramp, Charlie Ramp, Transient Ramp, the Mokapu House Lots Archaeological District at Pali Kilo, portions of the West Field area to the north of the runway, and areas that are adjacent to the Aviation District east of Charlie Ramp and Transient Ramp. The APE is approximately 508 acres.

The MCBH states there are approximately 65 architectural resources within the APE, as well as three historic districts. The historic districts are the Naval Air Station (NAS) Kaneohe Historic Aviation District, the Kaneohe Naval Air Station National Historic Landmark (NHL), and the Mokapu House Lots Archaeological District at Pali Kilo which have all been determined eligible listing in the National Register of Historic Places (NRHP) under Criteria A (American history) and C (architecture). Hangars 2 and 3 were built in 1941, and the three ancillary Aircraft Spares Storage buildings (Facilities 159, 160, 161) were built in 1942. They are contributing resources to the NAS Kaneohe Historic Aviation District.

The MCBH has determined thirty-one identified archaeological sites fall at least partially within this project's APE. Twenty-six of these sites have been evaluated as eligible for listing in the NRHP. The remaining four sites have not been evaluated. The Mōkapu Burial Area (50-80-11-1017) is approximately 60 meters (m) to the east, and outside of, the APE and is listed in the NRHP. MCBH has determined the archaeological sites previously documented within the APE can be divided into three primary temporal categories: traditional Hawaiian, non-military historic, and military; most sites within the APE are traditional Hawaiian in association.

In its January letter the MCBH determined the proposed project will result in an *adverse effect* based on 1) demolition of Hangar 3, which is eligible for listing in the National Register as a contributing element of the NAS Kaneohe Historic Aviation District and 2) demolition of Facilities 159, 160 and 161, which are small Aircraft Spares Storage buildings located adjacent to Hangar 3 and are contributing resources to the NAS Kaneohe Historic Aviation District. MCBH also determined the proposed undertaking may potentially result in an *adverse effect* on other historic properties based on installing tie-downs west of Hangar 5, which is in the vicinity of the NHRP-eligible Site 50-80-11-4453 archaeological deposits.

In a letter dated February 7, 2022 (Project No. 2022PR00034, Doc. No. 2202SH06), the SHPO agreed with the basis for a determination of *adverse effect* but opined MCBH must still take into consideration comments received from the public and interested parties, which may result in the identification of additional historic properties and/or raise additional concerns regarding project impacts prior to the SHPO's concurrence and prior to the drafting of a Memorandum of Agreement to address the identified effects. Additionally, the SHPD asked MCBH to provide a determination of eligibility for the four archaeological sites identified and an assessment of the project's potential impact to those sites. **The SHPD maintains this request** which needs to occur prior to finalizing the MOA.

The SHPD also requested MCBH please provide copies, or a summary of, responses received from the public and consulting parties to date.

Further, **the SHPD opines** there are a number of steps in the Section 106 process that are outstanding, which the MCBH needs to carry out prior to reaching a point in the Section 106 process in which a decision regarding effects to historic properties can be determined. These include the information requested above as well as:

- 1) Identification with context of the character-defining features of Bravo Ramp including strafing marks, bomb craters, and ancillary features.
- 2) Archaeological inventory survey(s) in areas likely to host archaeological remains and/or human remains that will undergo ground disturbance to a depth that could impact archaeological resources and human remains during the

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July 11, 2022

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undertaking should they be present. Further should there be significant archaeological sites which will be adversely affected by the undertaking the SHPD requests archaeological data recovery intensive excavation is conducted prior to the start of ground disturbing project work. This type of archaeological investigation conducted prior to the start of the project allows for better control of the investigation and methodology resulting in better data recovery and documentation than archaeological monitoring allows.

The first draft of the MOA only proposes archaeological monitoring as mitigation for any adverse impacts to archaeological resources. Further the draft MOA stipulates that any archaeological data identified after the MOA is executed would be treated as a post-review discovery as defined in 36 CFR 800.13. As SHPD has stated many times during consultation for this project and others at MCBH, archaeological monitoring during the project does not allow the archaeologist the best approach to archaeological methods of data recovery and often results in less data and deficient documentation. If archaeology is conducted during the project and all findings are treated as a post-review discovery, the SHPD, Native Hawaiian Organizations, and other consulting parties have very little opportunity to voice concerns and consult on the outcome of the finding.

To aid in planning efforts, **the SHPD requests** all information relating to the location of NAGPRA related items previously encountered in, or adjacent to, the APE. Please confirm that all archaeological and NAGPRA locational data within the APE has been presented in the MCBH's written consultation and in maps for this project.

At this time the SHPO opines the MOA was developed prematurely, as there are requirements of the Section 106 process that have not yet been met. At the request of MCBH, the SHPD provides the attached form (below) with its comments on the first draft; the SHPD review focused on the proposed stipulations within the draft MOA, therefore comments to the other sections of this document may be forthcoming.

The SHPD opines the proposed mitigation is not sufficient and additional efforts need to be considered. However, should any of the proposed mitigation be agreed upon, the MOA needs to be revised to impart explicit commitments regarding timelines to complete the mitigation prior to completion of the undertaking, party involvement, and clear descriptions of the anticipated final product.

The SHPO looks forward to continuing Section 106 consultation for the proposed project.

Please submit the above to the SHPD HICRIS to Project No. 2022PR00034 using the Project Supplement option.

The MCBH is the office of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Stephanie Hacker, Historic Preservation Archaeologist IV, at Stephanic.Hacker@hawaii.gov or at (808) 692-8046 for matters regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christopher Frantz, MCBH (christopher.frantz@usmc.mil)
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REVIEW COMMENTS

Project Title: MEMORANDUM OF AGREEMENT (MOA) BETWEEN MARINE CORPS BASE HAWAII (MCBH) AND THE HAWAII STATE HISTORIC PRESERVATION OFFICER (SHPO) REGARDING THE HOME BASING OF THE MQ-9 UNMANNED AERIAL VEHICLE SQUADRON AND KC-130J AERIAL REFUELER TRANSPORT AIRCRAFT SQUADRON AT MARINE CORPS BASE HAWAII, KANEOHE BAY (July 2022)

No.	Page	Section	Line Description	Comment	Action
1.	Global			Our review is preliminary and focused mainly on the Stipulations at this time. Additional comments to the other sections of this document may be forthcoming.	
2.	1		22-27	Please clarify which historic properties are within the Naval Air Station (NAS) Kaneohe Aviation District	
3.	1-2		37-42	Are there archaeological sites which will be impacted and if so why are they not listed here?	
4.	3	I.	70-71	Remove or "under the direct supervision"	
5.	3	II.		<p>How does the proposed mitigation contribute to the loss of the character of the overall district? Suggest an update to the district.</p> <p>What is proposed as mitigation measures to avoid, minimize, and mitigate as presented is not adequate to serve the loss of features of the district. We would like MCBH to list and consult on all mitigation proposed to date such as:</p> <ul style="list-style-type: none"> -Update and submit the Aviation district NRHP nomination. -Context study or design manual focused on the Albert Khan building with commitments to carry out. -A supplement to the historic building maintenance plan for the Khan Buildings with commitments to carry out. -Preserve or rehabilitate the Seaplane Ramp -Update and Implement the Study for Rehabilitation Treatment for Pless Hall, Building 212 -Archaeological Data Recovery Prior to Project Implementation <p>We also suggest:</p> <ul style="list-style-type: none"> -Update the archaeological maps and cultural sensitivity maps based on the outcome of the ground disturbance from this undertaking. -Avoidance to the strafing marks at Bravo Ramp 	
6.	3	II.		While these commitments, as proposed, may not be adequate (this needs further review and discussion), if MCBH is to propose the actions in Section II.B then there needs to be explicit commitments regarding timelines (we would want construction prior to project completion), parties involvement, and expectations of the end product	
7.	3	II.A.1.		SHPD requests data recovery in areas which archaeological resources may be impacted ahead of the start of the project.	
8.	3	II.B.1	93	What kind of study?	

9.	3	II.B.1		<p>This action needs to be conducted ahead of this agreement document, as part of the identification efforts under the Section 106 process, rather than as mitigation.</p> <p>To mitigate the loss of the Bravo Ramp and its character defining features suggestions include: Rehabilitate/Restore, or Preserve the seaplane ramp. A short video (~10-15 minutes) geared towards the public telling the story of the December 7 attacks on MCBH that highlights the impacts to MCBH and which digitally portrays the aftermath including the strafing marks and other features on the Bravo Ramp .</p>	
10.	3	II.B.2.	96-98	<p>As mitigation to the lost character/demolitions within the district one suggestion was: rehabilitation and preservation of the Pless Hall prior to completion of the new Hangar. To provide parties with a copy of a study and to update that study as proposed, is not sufficient mitigation.</p> <p>Introduce Pless Hall, historical context and location prior to this first mention.</p>	
11.	3	II.B.3	99-100	<p>If it was decided that this proposed action is adequate and appropriate mitigation to the impact or loss of a historic property, <i>then</i> there should be commitments for implementation of the plan and steps in the MOA for how to reach consensus on what is adequate for the plan. This proposed plan requires explicit details as to how it will be carried out, by whom, and what the final product will look like.</p> <p>As part of the MOA development a scope of work for the plan must be provided which covers the geographic area to be covered, types of resources to be highlighted, the topic(s) of tour information, nature of the interpretive materials, the frequency and duration of tours, tour guide training program/qualifications, monitoring and reporting components, who has access to the tours, provisions for public access. Further must identify who at MCBH is responsible for meeting these commitments? Who determines whether the information is acceptable? How will the tours be advertised to reach the public?</p>	
12.	4	II.B.5.a.		<p>Revise to say the draft products must be accepted by SHPD, and MCBH will provide SHPD and the consulting parties the opportunity to make changes to what is proposed.</p>	
13.	4	II.C.		<p>Please add a section addressing the impacts to Hangar 102 to include its character defining features and how they will or will not be impacted, what commitments MCBH is making to preserve the character of this Hangar, and the entire scope of changes to 102, Include information regarding any strafing marks within or near 102.</p>	

14.	4	II.C.1.	113	Clarify that Hangar 103 is being demolished and that a new Hangar will be constructed in its place which MCBH is referring to as Hangar 103 as well, if that is the correct understanding.	
15.	4	II.C.1.	114	Minimize effects to what?	
16.	4	C.		Will consulting parties have the opportunity to change/revise the conceptual design? Please clarify whether there is an ability for consulting parties to alter the outcome of the design. As some parties understood this was a predetermined design, therefore what could be modified through this consultation?	

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Appendix D
Endangered Species Act Section 7 Consultation

To be provided

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Appendix E
Coastal Zone Management Act Coordination

To be provided

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