REVISED DRAFT ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF A C-40A AIRCRAFT MAINTENANCE HANGAR AT MARINE CORPS BASE HAWAII, KANEOHE BAY, OAHU, HAWAII

MARCH 2025

Unique ID Number: EAXX-007-17-XMC-1739395525

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ABSTRACT

Designation:	Environmental Assessment
Title of Proposed Action:	Construction of a C-40A Aircraft Maintenance Hangar (MILCON P-2001)
Project Location:	Marine Corps Base Hawaii (MCBH), Kaneohe Bay, Oahu, Hawaii
Affected Region:	City and County of Honolulu, Oahu, Hawaii
Action Proponent:	Naval Air Force Reserve VR-51
Point of Contact	Naval Facilities Engineering Systems Command, Pacific 258 Makalapa Drive, Suite 100 Joint Base Pearl Harbor-Hickam, HI 96860-3134 Attn: EV21 Project Mgr. MCBH C-40A Hangar EA Email: NAVFAC_PAC_EV_RECEIVE2@us.navy.mil
Unique ID Number:	EAXX-007-17-XMC-1739395525

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality implementing regulations, Department of Navy Chief of Naval Operations (OPNAV) Manual 5090.1, and Marine Corps Order 5090.2 Volume 12. The Proposed Action is to construct an aircraft maintenance hangar for new United States (U.S.) Naval Air Force Reserve VR-51 C-40A aircraft on Marine Corps Base Hawaii (MCBH). VR-51 is a tenant on MCBH. Although the transition to the C-40A aircraft has already occurred, this EA analyzes impacts associated with construction of a maintenance hangar, in addition to operational impacts of the C-40A. The Draft EA was circulated for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Action Proponent to review the proposed action and potential construction and operations impacts. The Draft EA has been revised and will be recirculated for another formal public review.

This EA evaluates the potential environmental direct and indirect impacts of the Proposed Action to the following resources: air quality, water resources, natural resources, natural hazards and resiliency, cultural resources, infrastructure, noise, and hazardous materials and waste.

EXECUTIVE SUMMARY

ES. 1 Proposed Action

The Proposed Action is to construct an aircraft maintenance hangar for new United States (U.S.) Naval Air Force Reserve VR-51 C-40A aircraft on Marine Corps Base Hawaii (MCBH). Additional aircraft parking apron and other supporting infrastructure modifications are also required to support aircraft maintenance and operations. In 2019, VR-51 transitioned aging C-20G aircraft to the newer, more capable C-40A aircraft at MCBH. Although the transition to the newer aircraft has already occurred, this EA analyzes impacts associated with construction of a maintenance hangar, in addition to operational impacts of the C-40A.

ES. 2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide adequate hangar space for the maintenance and protection of C-40A aircraft operated by VR-51 of the Naval Air Force Reserve. VR-51 is a tenant on MCBH.

The Proposed Action is needed to ensure VR-51 has adequate indoor space to conduct required inspection, service, maintenance, and corrosion prevention for their C-40A aircraft and to provide shelter for a single aircraft during storm events.

As stated above, the C-40A aircraft transition has already occurred and this EA analyzes impacts associated with construction of a maintenance hangar, in addition to operational impacts of the C-40A.

ES. 3 Alternatives Considered

Alternatives for constructing a hangar were developed based upon the following alternative screening factors:

1. The hangar must be located within the Airfield Area of MCBH, or on another available DoD-controlled secure military airfield on the Island of Oahu to avoid regular long-haul flights to conduct required maintenance.

2. Adequate land must be available, compatible with aviation uses, and sufficiently sized and configured to safely accommodate a Type III aircraft maintenance hangar with associated aircraft parking apron that facilitates the C-40A turning radius. Site compatibility was assessed using the following considerations:

    a. Site does not interfere or conflict with airfield safety requirements (runway primary surface and transitional surfaces; minimizes runway vehicle crossings);

    b. Site does not have other inherent safety risks, such as overlapping explosive safety quantity-distance arcs (ESQDs), located in a tsunami evacuation zone, or located in a high flood zone; and

    c. Site is compatible with existing mission operations and approved base planning documents. The site would not conflict with the function of existing mission assets. The site would also not conflict with installation master plans, Integrated Natural Resource Management Plans, Integrated Cultural Resource Management Plans or mission-related base instructions.

3. Site has adequate runway length, pavement strength, configuration, security and secure communications systems to support C-40A aircraft landings and takeoffs.

The Navy is considering two action alternatives that meet the purpose and need of the Proposed Action and a No Action Alternative. The first alternative would construct a hangar at the Hangar 104 Site

(Alternative 1 - Preferred Alternative) on MCBH. The second alternative (Alternative 2) would construct a hangar at the Green Field Site on MCBH. Both alternatives would involve demolition of facilities and construction of parking apron and other support facilities. As stated above, the C-40A aircraft transition has already occurred. Both alternatives include the continued operations of the C-40A.

ES. 4 Summary of Environmental Resources Evaluated in the EA

The following resource areas have been addressed in this EA: Air Quality, Water Resources, Natural Resources, Natural Hazards and Resiliency, Cultural Resources, Infrastructure, Noise, and Hazardous Materials and Waste.

Because potential impacts were considered to be insignificant, negligible or nonexistent, the following resources were not evaluated in this EA: Geological Resources, Land Use, Airspace, Transportation, and Socioeconomics.

ES. 5 Summary of Potential Environmental Consequences of the Action Alternatives and Mitigation

Air Quality. Under either action alternative, annual construction emissions would fall below *de minimis* levels and would not affect maintenance of local air quality standards. Carbon dioxide emitted during construction under Alternative 1 would be 468 tons; 286 tons would be emitted under Alternative 2. Embodied carbon for constructing the hangar at either site would be approximately 1540 tons based on concrete and steel production. The hangar would not include paint booths or other features that would require air permitting. Operations of the C-40A aircraft would not significantly increase air emissions or impact local air quality standards.

Water Resources. With the use of stormwater Best Management Practices (BMPs) during construction, neither alternative would cause adverse effects to water resources. The hangar would use a water-only fire suppression system to avoid potential adverse effects of releases of aqueous film forming foam. No wetlands would be affected by the project at either location. Wastewater from the hangar would be treated by the MCBH Water Reclamation Facility. Operations of the C-40A aircraft would not significantly impact water resources.

Natural Resources. MCBH submitted a Biological Assessment to the U.S Fish and Wildlife Service (USFWS) Pacific Islands Office in January 2023 that found that the project at either site location would have no effect on, or is not likely to adversely affect, any special status species. To reduce or avoid potential effects to birds and wildlife, several conservation measures would be applied (see Table 2-3). Operations of the C-40A aircraft would not significantly impact natural resources.

Natural Hazards and Resiliency. Flooding at either site is possible but at a frequency less than 1 percent annually. DoD structural engineering standards would provide for seismic and wind loads to minimize adverse effects from natural hazards. Sea level rise over the long term would adversely affect either site alternative, as well as the MCBH airfield area as a whole.

Cultural Resources. Demolishing Hangar 104 under Alternative 1 would result in an adverse effect to the Naval Air Station Kaneohe Bay Aviation Historic District. Hangar 104 is a contributing element to the Naval Air Station Kaneohe Bay Aviation Historic District. Hangar 104 is outside the period of significance for the adjacent National Historic Landmark (NHL) and would not diminish the NHL's defining characteristics. The Navy is consulting with SHPO and other interested parties to resolve adverse effects to cultural resources though identified mitigation measures that will be memorialized in a Memorandum of Agreement (MOA). The Navy would implement archaeological monitoring and other measures to minimize adverse effects to potential archaeological resources at the Hangar 104 Site.

If Alternative 2 were selected, the action would not result in an adverse effect to the Historic District; however, archaeological monitoring would still be required.

Infrastructure. The Alternative 1 Site has existing utilities with capacity to support a new hangar on the site. Alternative 2 overlaps several utilities, mission facilities, parking areas and access roads that would need to be replaced prior to construction of a hangar. These pre-construction projects for Alternative 2 would add substantial time and cost to the hangar project.

Noise. Construction noise would generally be lower than existing aircraft noise levels in the airfield area. Under either action alternative, construction noise would occur primarily during day-light hours. At 500 feet from the construction source, noise would decrease to approximately 54 decibels (dB) resulting in noise levels that would be indistinguishable within the acoustic environment of the airfield (MCBH, 2022A). Construction noise would not be perceptible to on-base or off-base residents or sensitive receptors. A Noise Study (Appendix F) was conducted in support of this EA. Although the noise profile of the C-40A is different from the C-20G, the C-40A aircraft do not increase the number of VR-51 flight operations at MCBH, nor do they require any additional support personnel. The Noise Study concluded that the C-40A is louder individually, but there are fewer operations, and are in small numbers compared to the overall traffic. Individual events are louder in some locations, but the overall effect to the cumulative noise environment is negligible (Appendix F).

Hazardous Materials and Waste. Under Alternative 1, Hangar 104 likely contains asbestos-containing materials that would require removal by qualified professionals in accordance with applicable state and federal health, safety and environmental regulations prior to demolition. Demolition of the hangar would result in approximately 9500 tons of waste, most of which would be disposed of at a facility that routinely recycles construction materials. Under Alternative 2, three buildings would require demolition and replacement (410 tons of construction waste) and demolition of parking areas and access roads would generate additional recyclable asphalt waste. Overall, effects from hazardous materials and wastes would be minor with the use of BMPs and adherence to state and federal regulations.

Table ES-1 provides a summary of the potential impacts to the resources associated with each of the alternative analyzed.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Alternative 1- Construct C-40A Hangar at the Hangar 104 Site	Alternative 2- Construct C-40A Hangar at the Green Field Site
Air Quality	No change	Less than significant effects to air quality. Construction activities would only minimally increase CO_2 emissions temporarily and would not substantially contribute to global climate change. Operations would not significantly increase air emissions or impact local air quality standards.	Less than significant effects to air quality. Construction activities would only minimally increase CO_2 emissions temporarily and would not substantially contribute to global climate change. Operations would not significantly increase air emissions or impact local air quality standards.
Water Resources	No change	Less than significant impacts to groundwater, surface water, wetlands, and floodplains.	Less than significant impacts to groundwater, surface water, wetlands, and floodplains.
Natural Resources	No change	Less than significant impacts to vegetation, wildlife, critical habitat, and ESA-listed species.	Less than significant impacts to vegetation, wildlife, critical habitat, and ESA-listed species.
Natural Hazards and Resiliency	No change	Less than significant impacts associated with natural hazards and resiliency.	Less than significant impacts associated with natural hazards and resiliency.
Cultural Resources	No change	Less than significant impacts to archaeological resources. Impacts to archaeological sites would be minimized through archaeological monitoring.	Less than significant impacts to archaeological resources. Impacts to archaeological sites would be minimized through archaeological monitoring.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	No Action Alternative	Alternative 1- Construct C-40A Hangar at the Hangar 104 Site	Alternative 2- Construct C-40A Hangar at the Green Field Site
		Adverse impacts to historic resources would be mitigated to less than significant levels through incorporation of proposed mitigation measures developed in the NHPA Section 106 process.	Less than significant impacts to historic resources.
Infrastructure	No change	Less than significant effects to infrastructure.	Less than significant effects to infrastructure.
Noise	No change	Less than significant effects to noise.	Less than significant effects to noise.
Hazardous Materials and Wastes	No change	Less than significant effects to hazardous materials and wastes.	Less than significant effects to hazardous materials and wastes

ES. 6 Public Involvement

The Draft EA was circulated for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Action Proponent to relook at the proposed action and potential construction and operations impacts. The Draft EA has been revised and will be recirculated for another formal public review. Public and agency comments and responses will be provided in Appendix A.

ENVIRONMENTAL ASSESSMENT

CONSTRUCTION OF A C-40A AIRCRAFT MAINTENANCE HANGAR AT

MARINE CORPS BASE HAWAII, KANEOHE BAY,

OAHU, HAWAII

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ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standard
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing material
AFFF	Aqueous Film Forming Foam
AHJ	Authorities Having Jurisdiction
APE	Area of potential effects
BASH	Bird/Wildlife Aircraft Strike Hazard
BEQ	Bachelor Enlisted Quarters
BMP	Best Management Practices
C&D	Construction and demolition
CAA	Clean Air Act
CFLSW	Commander Fleet Logistics Support Wing
CFR	Code of Federal Regulations
CNAFR	Commander Naval Air Force Reserve
CO_2	Carbon dioxide
CWA	Clean Water Act
cy	Cubic yards
CZMA	Coastal Zone Management Act
DoD	U.S. Department of Defense
DOH	State of Hawai‘i Department of Health
DoN	Department of the Navy
DOT	Department of Transportation
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Review Program
ESA	Endangered Species Act
ESQD	Explosive safety quantity-distance
F3	Fluorine free foam
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
ft	Foot/feet

FY	Fiscal year
GIS	Geographic Information System
HABS	Historic American Buildings Survey
HAR	Hawaii Administrative Rules
HCS/ILS	Historic Context Study / Intensive Level Survey
ICRMP	Integrated Cultural Resources Management Plan
in	Inch(es)
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
JBPHH	Joint Base Pearl Harbor Hickam
LID	Low impact development
M	Military 20th Century
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCBH	Marine Corps Base Hawaii
MILCON	Military construction
MMT	Million metric tons
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
MV-22	Tilt-rotor aircraft, aka the Osprey
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command NEPA
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHO	Native Hawaiian Organization
NHPA	National Historic Preservation Act
NGPC	Notice of General Permit Coverage
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrous Oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRE	National Register Eligible

NRHP	National Register of Historic Places
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PM10	Particulate Matter less than 10 microns
PSD	Prevention of Significant Deterioration
sf	Square feet
SHPO	State Historic Preservation Officer
SOI	Secretary of Interior
SOx	Sulfur Oxides
TH	Traditional Hawaiian pre-contact/19th Century
U.S.	United States
UFC	Unified Facilities Criteria
USC	United States Code
USMC	United States Marine Corps
VOC	Volatile Organic Compound
VR-51	Fleet Logistics Squadron 51

1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) addresses construction of an aircraft maintenance hangar and associated parking apron at Marine Corps Base Hawaii (MCBH). In 2019, the U.S. Naval Air Force Reserve transitioned aging C-20G aircraft to the newer, more capable C-40A aircraft at MCBH. A total of two C-40A aircraft were transitioned to MCBH. Although the transition to the newer aircraft has already occurred, this EA analyzes impacts associated with construction of a maintenance hangar, in addition to operational impacts of the C-40A.

This EA was prepared pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4321 et seq.), and its implementing regulations issued by the Council on Environmental Quality (CEQ) (40 CFR Part 1500 - 1508), OPNAV Manual 5090.1, and Marine Corps Order 5090.2 Volume 12. The Department of the Navy (DON) is aware of the November 12, 2024 decision in Marin Audubon Society v. Federal Aviation Administration, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the CEQ regulations implementing NEPA are not judicially enforceable or binding on this agency action, the DON has nonetheless elected to follow those regulations at 40 C.F.R. Parts 1500– 1508, in addition to DON's procedures/regulations implementing NEPA at 32 C.F.R. Part 775, to meet the agency's obligations under NEPA, 42 U.S.C. §§ 4321 et seq.

The goal of this EA is to ensure that comprehensive and systematic consideration is given to potential environmental impacts that may result from implementing the Proposed Action, or any reasonable alternative action, upon the natural, man-made, or social environment. The information presented in this EA will result in either a Finding of No Significant Impact (FONSI), lead to preparation of an Environmental Impact Statement, or no action on the proposal.

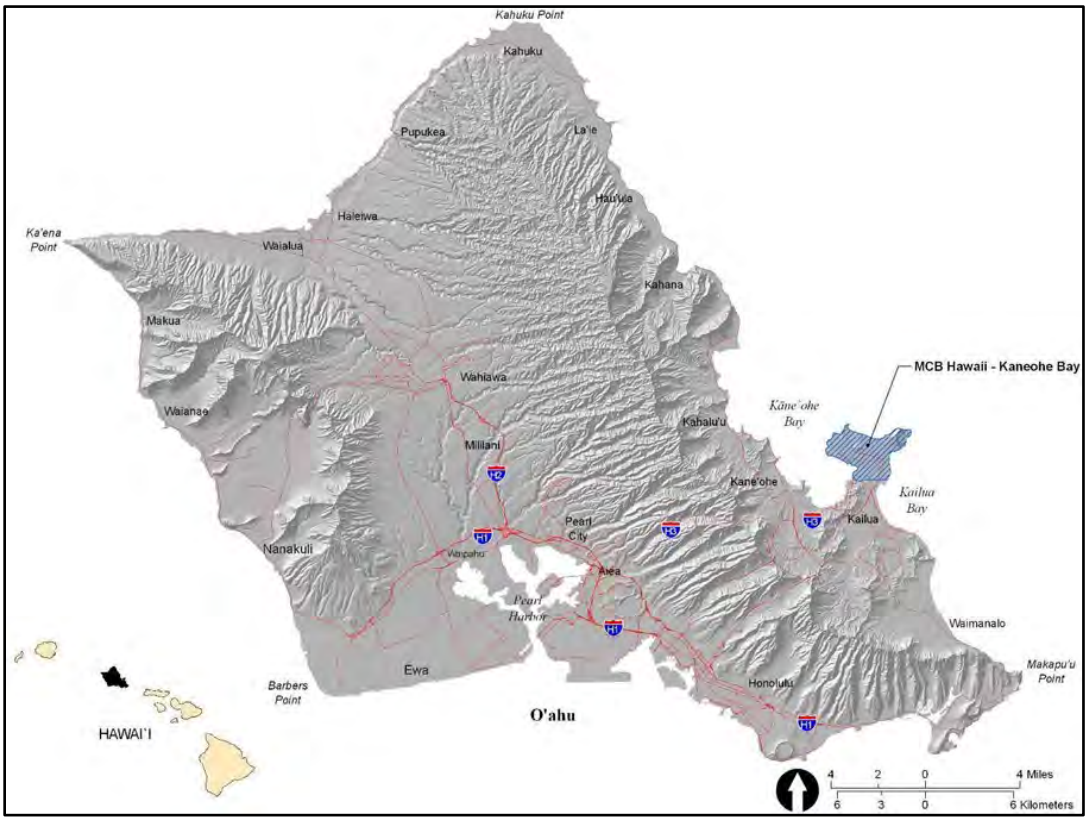
1.2 PROJECT LOCATION AND SURROUNDING ENVIRONMENT

The Proposed Action is located in the State of Hawaii at MCBH. Refer to Figure 1-1 for a location map.

MCBH encompasses 2,951 acres and is located on Oahu's eastern shore, on 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 MCBH.

MCBH has historic properties, including a row of hangars between 1st Street and Bravo Ramp that are contributing resources to the National Register of Historic Places (NRHP)-eligible Naval Air Station (NAS) Kaneohe Historic Aviation District (Aviation District). Additionally, MCBH has a National Historic Landmark (NHL) District associated with the World War II attacks on Hawaii.

Figure 1-1. Marine Corps Base Hawaii Location



1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Proposed Action is to construct an aircraft maintenance hangar for new U.S. Naval Air Force Reserve VR-51 C-40A aircraft on Marine Corps Base Hawaii (MCBH). Additional aircraft parking apron and other supporting infrastructure modifications are also required to support aircraft maintenance and operations. In 2019, the U.S. Naval Air Force Reserve transitioned aging C-20G aircraft to the newer, more capable C-40A aircraft at MCBH. Although the transition to the newer aircraft has already occurred, this EA analyzes impacts associated with construction of a maintenance hangar, in addition to operational impacts of the C-40A.

The purpose of the Proposed Action is to provide adequate hangar space for the maintenance and protection of C-40A aircraft operated by Fleet Logistics Squadron 51 (VR-51) of the Naval Air Force Reserve. VR-51 is a current tenant on MCBH.

The Proposed Action is needed to ensure VR-51 has adequate indoor space to conduct required inspection, service, maintenance, and corrosion prevention for C-40A aircraft and to provide shelter for a single aircraft during storm events. As stated above, the C-40A aircraft transition has already occurred and this EA analyzes impacts associated with construction of a maintenance hangar in addition to operational impacts of the C-40A. VR-51 currently operates from Hangar 104 on the southwest corner of MCBH. The hangar is one of five hangars built in the 1940s. Hangar 104's dimensions are 320 feet by 240 feet, with a clearance height of 32 feet (spanned by steel trusses). The hangar's ceiling is 3 feet shorter than the height of the C-40A, which is the primary issue preventing storage and maintenance of these aircraft in the existing facility. Under the Proposed Action, a Type III hangar would be constructed with adequate ceiling height, but with a smaller footprint than Hangar 104.

1.4 PROJECT BACKGROUND

1.4.1 VR-51 Squadron Mission

VR-51's mission is to operate Navy Unique Fleet Essential Airlift aircraft on a worldwide basis to provide responsive, flexible and rapid deployable air logistics support required to sustain combat operations at sea. VR-51 is an active squadron that reports directly to Commander Fleet Logistics Support Wing (CFLSW). CFLSW reports to the type commander, Commander Naval Air Force Reserve (CNAFR). The squadron is responsible for operation of the aircraft, as well as providing interim contractor maintenance support and contractor logistics support. There are several active Fleet Logistics Support Squadrons within the U.S. at strategic geographical locations to support naval operations. Maintaining a squadron in Hawaii is essential to provide the necessary support to naval operations within the Pacific.

In Fiscal Year 2017, Congress approved the transition from use of the C-20G aircraft to the C-40A aircraft. The C-40A provide improved mission capabilities that include a larger cargo capacity and more room to carry personnel. The C-40A aircraft were transitioned aboard MCBH in 2019. The C-40A is a derivative of the Boeing 737-700C commercial airliner. Its wingspan is 117.5 feet, height is 41.2 feet, and length is 110.5 feet. The aircraft can be configured to carry varying amounts of passengers and cargo. At maximum, it can carry either 121 passengers or 36,000 pounds. Another likely configuration is 69 passengers with 15,000 pounds of cargo. As a medium-lift aircraft, the U.S. Navy can fulfill its Navy Unique Fleet Essential Airlift missions by providing long-range, high-priority logistical airlift support of fleet activities. VR-51 currently operates out of Hangar 104 on the southwest corner of MCBH. The hangar is one of five hangars built in the 1940s.

Of the two C-40A aircraft now in use at VR-51, one was new from the production line at Boeing, and the other was previously squadroned with VR-57 in San Diego. One of the previous C-20G aircraft is now in use by a Marine Corps unit at Kaneohe Bay, and the other is at the 309th Aerospace Maintenance and Regeneration Group, a U.S. Air Force aircraft and missile storage and maintenance facility in Tucson, Arizona. This EA has been revised to include discussion of operational impacts.

1.5 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 Section 3, Introduction. Resources analyzed in detail include:

- Air Quality
- Water Resources
- Natural Resources
- Natural Hazards and Resiliency
- Cultural Resources
- Infrastructure
- Noise
- Hazardous Materials and Waste.

Resources that were not analyzed in detail are described and explained in the introduction to Section 3, Affected Environment and Environmental Consequences.

1.6 Relevant Laws and Regulations

The Navy has prepared this EA, subject to Marine Corps approval, based on federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action (see Section 5.3).

1.7 Public and Agency Participation and Intergovernmental Coordination

The Navy is soliciting public and agency input regarding the Proposed Action through publication of the Revised Draft EA.

https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/C40-Hanger-EA/

The Draft EA was circulated for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts, particularly to noise. The Draft EA was revised and will be recirculated for another formal public review in early 2025. All comments received during the public comment period will be fully considered by the Navy prior to rendering a decision on the Proposed Action. Public and agency comments are provided in Appendix A.

In accordance with Section 106 of the NHPA, consultation is in progress with the Hawaii State Historic Preservation Officer (SHPO), Native Hawaiian Organizations (NHOs), National Park Service, and other interested parties regarding a finding of adverse effects to historic properties resulting from the Proposed Action. Section 106 consultation was initiated with the Hawaii SHPO for the undertaking on 21 November 2021, along with consultation with the National Park Service regarding potential effects to the National Historic Landmark. The Navy and MCBH also provided the public with information about this undertaking and its effects on historic properties and solicited public comment and input. Section 106 consultation correspondence is located in Appendix B.

Informal consultation with USFWS, Pacific Islands Office was conducted under Section 7 of the Endangered Species Act (ESA) for the Proposed Action's potential impacts to ESA-listed species (see Appendix C for correspondence). USFWS Pacific Islands Office stated that with the incorporation of conservation measures, effects to listed species are either too small to be meaningful or measurable, or extremely unlikely to occur.

The State of Hawaii Office of Planning and Sustainable Development Planning Division was notified of the project's exemption with regard to the Coastal Zone Management Act (CZMA). The proposed action falls under the Navy/Marine Corps De Minimis List Activities (Appendix D).

1.8 Permits and Approvals

A Notice of General Permit Coverage (NGPC) from the State of Hawaii Department of Health (DOH) for a Notice of Intent – Construction will be required. The project will adhere to MCBH's existing permits and compliance agreements including:

- National Pollutant Discharge Elimination System (NPDES) No. HIS000007 (MS4 Stormwater)
- NPDES No. HI0110078 (Wastewater)
- 2022 Federal Facilities Compliance Agreement between the U.S. Environmental Protection Agency (EPA) and the U.S. Marine Corps

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 DESCRIPTION OF THE PROPOSED ACTION

This EA addresses proposed construction and operation of a modified Type III aircraft hangar at MCBH, with an aircraft apron and other supporting infrastructure modifications, to support the VR-51 squadron's C-40A aircraft. In Fiscal Year 2017, Congress approved the transition from use of the C-20G aircraft to the C-40A aircraft. The C-40A provide improved mission capabilities that include a larger cargo capacity and more room to carry personnel. Two C-40A aircraft were transitioned aboard MCBH in 2019. VR-51 currently operates from Hangar 104, which ceiling is 3 feet shorter than the height of the C-40A. Under the Proposed Action, a Type III hangar would be constructed with adequate ceiling height. In accordance with DoD facilities criteria (WBDG, 2021), the most appropriate design to accommodate the aircraft would be a Type III high-bay aircraft maintenance hangar with low-rise space for administration, maintenance, and parts storage. A Type III hangar is principally designed for large transport aircraft and are not authorized to have a bridge crane. The Type III hangar's exterior dimensions (including offices and shop spaces) are nominally 280 feet wide, 200 feet deep, with its top roof 84 feet tall.

The hangar would have a steel-frame construction, standing seam metal roof over a metal deck, concrete-filled metal deck floors and a pile foundation. The hangar would include an elevator, uninterruptable power supply, electrical and communications utilities, an emergency generator, a compressed air system, a radon mitigation system, bird netting, fall arrest systems, a fire suppression system, and cybersecurity and anti-terrorism features. Mechanical utilities include potable and fire protection water, wastewater, storm drainage, and fire protection effluent/fuel retention tank. The project would also include flight-line security fencing, vehicle rolling gates and a new sentry house. Another key feature of the project would be an aircraft parking apron of sufficient size to accommodate the turning radius of the C-40A that also provides for parking of two aircraft. Each site alternative would require some degree of demolition and replacement/relocation of existing infrastructure as described in Section 2.3.

The design would also meet MCBH's standards for exterior lighting developed in consultation with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA), which also incorporate International Dark-Sky standards.

The transition of the new type of aircraft is similar to usage of the previous aircraft at MCBH. Annual aircraft operations would not increase under the Proposed Action. Currently takeoffs and landings of C-40A aircraft represent approximately one percent of the total MCBH annual aircraft operations (MCBH, 2022A).

2.2 Screening Factors

The Navy and Marine Corps analyzed modifying the existing Hangar 104 to elevate the roof and reconfigure the supporting structure to accommodate the wingspan of the aircraft; however, this option would not address the insufficient weight rating of the existing floor. Because the 'renovation' option would need to also include complete replacement of the foundation, as well as support structure, the associated degree of demolition for such a project would leave little to none of the existing hangar intact; therefore, the screening criteria focused on identifying locations for building a new hangar.

Screening criteria included:

1. The hangar must be located within the Airfield Area of MCBH, or on another available DoD-controlled secure military airfield on the Island of Oahu to avoid regular long-haul flights to conduct required maintenance.
2. Adequate land must be available, compatible with aviation uses, and sufficiently sized and configured to safely accommodate a Type III aircraft maintenance hangar with associated aircraft

parking apron that facilitates the C-40A turning radius. Site compatibility was assessed using the following considerations:

a) Site does not interfere or conflict with airfield safety requirements (runway primary surface and transitional surfaces; minimizes runway vehicle crossings);

b) Site does not have other inherent safety risks, such as overlapping explosive safety quantity-distance arcs (ESQDs); and

c) Site is compatible with existing mission operations and approved base planning documents. The site would not conflict with the function of existing mission assets. The site would also not conflict with Installation Master Plans, Integrated Natural Resource Management Plans, Integrated Cultural Resource Management Plans or mission-related base instructions.

3. Site has adequate runway length, pavement strength, configuration, security and secure communications systems to support C-40A aircraft landings and takeoffs.

2.3 ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

This EA analyzes two action alternatives and the No Action Alternative. Both action alternative sites are located on MCBH within the airfield area (Figure 2-1 and Figure 2-2). Alternatives considered, but which did not meet the screening factors are described in Section 2.4.

Figure 2-1. Airfield Area on MCBH

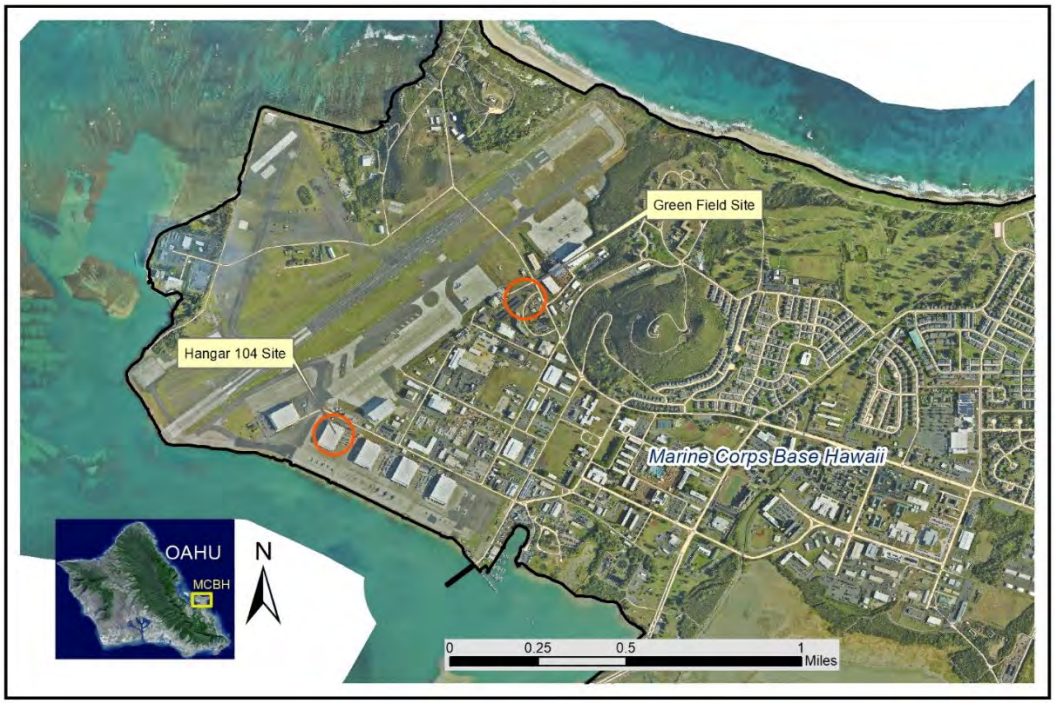


Figure 2-2. Action Alternative Sites for a C-40A Hangar at MCBH

2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action of constructing a new C-40A aircraft hangar would not occur.

Under the No Action Alternative, the VR-51 squadron would continue—based on availability—to utilize off-base hangar space at Joint Base Pearl Harbor Hickam (JBPHH) or on the U.S. mainland for maintenance. The associated high degree of operational inefficiency would continue. Maintenance (both routine scheduled tasks, as well as unscheduled and emergency maintenance) is frequently delayed due to the lack of a dedicated hangar aboard MCBH. Currently, VR-51 aircraft must transit to other squadrons, such as VR-57 in San Diego or VR-58 in Jacksonville, Florida, to accomplish needed maintenance.

The No Action Alternative does not meet the purpose and need for the Proposed Action, because long-haul flights for maintenance actions adds significant cost to squadron operations, places assets out of use for longer periods of time, and increases the potential for aviation accidents. Use of hangars on JBPHH is also not viable as a long-term solution as the Navy is given low priority for scheduling these specific spaces. As these aircraft age, unscheduled repairs and maintenance will occur more often, exacerbating existing scheduling problems and leading to long periods where aircraft are unavailable for missions; however, as required by NEPA, the No Action Alternative is analyzed to consider the environmental consequences of not executing the Proposed Action and to establish a comparative baseline for analysis of the action alternatives.

2.3.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Under Alternative 1, the existing VR-51 hangar (Hangar 104) would be demolished and a Type III hangar would be constructed within its footprint (Figure 2-2 and Figure 2-3). The new hangar would cover approximately 67,000 square feet (sf) or 1.6 acres. The associated aircraft parking apron would cover another 1 acre. Additional pavements around the hangar would be replaced. This alternative includes the continued operations of the C-40A.

To construct a new hangar on the site, the following existing site elements would first be demolished:

- Hangar 104 (110,000 sf footprint)
- Building 4048 (gate/sentry house, 125 sf)
- Building 4042 (generator building, 670 sf)

Prior to demolition of Hangar 104, VR-51 would use Hangar 105 as a temporary 'swing space.'

Hangar 104 was originally constructed in 1941 and is located within the NRHP-eligible NAS Kaneohe Aviation Historic District. The hangar, which is a contributing element to the Aviation District, is also independently eligible for listing on the National Register of Historic Buildings. The site is next to Bravo Ramp, which is part of the NAS Kaneohe NHL District. Buildings 4048 and 4042 were constructed in 1987 and are not eligible for the NRHP and are not contributing resources to the two historic districts.

Figure 2-3. Proposed Hangar and Mat Layout at the Hangar 104 Site

2.3.3 Alternative 2- Green Field Site

Under Alternative 2, a Type III hangar would be constructed on a semi-vacant parcel (referred to as the Green Field Site bounded by Mokapu Road to the north and the Marine Corps Air Station (MCAS) Terminal to the southeast (Figure 2-2 and Figure 2-4). The Green Field Site is an eight-acre area that consists of storage sheds, meteorological equipment, and open space. The hangar itself would cover approximately 1.6 acres. The Visiting Aircraft Line is immediately adjacent to this site. This alternative includes the continued operations of the C-40A.

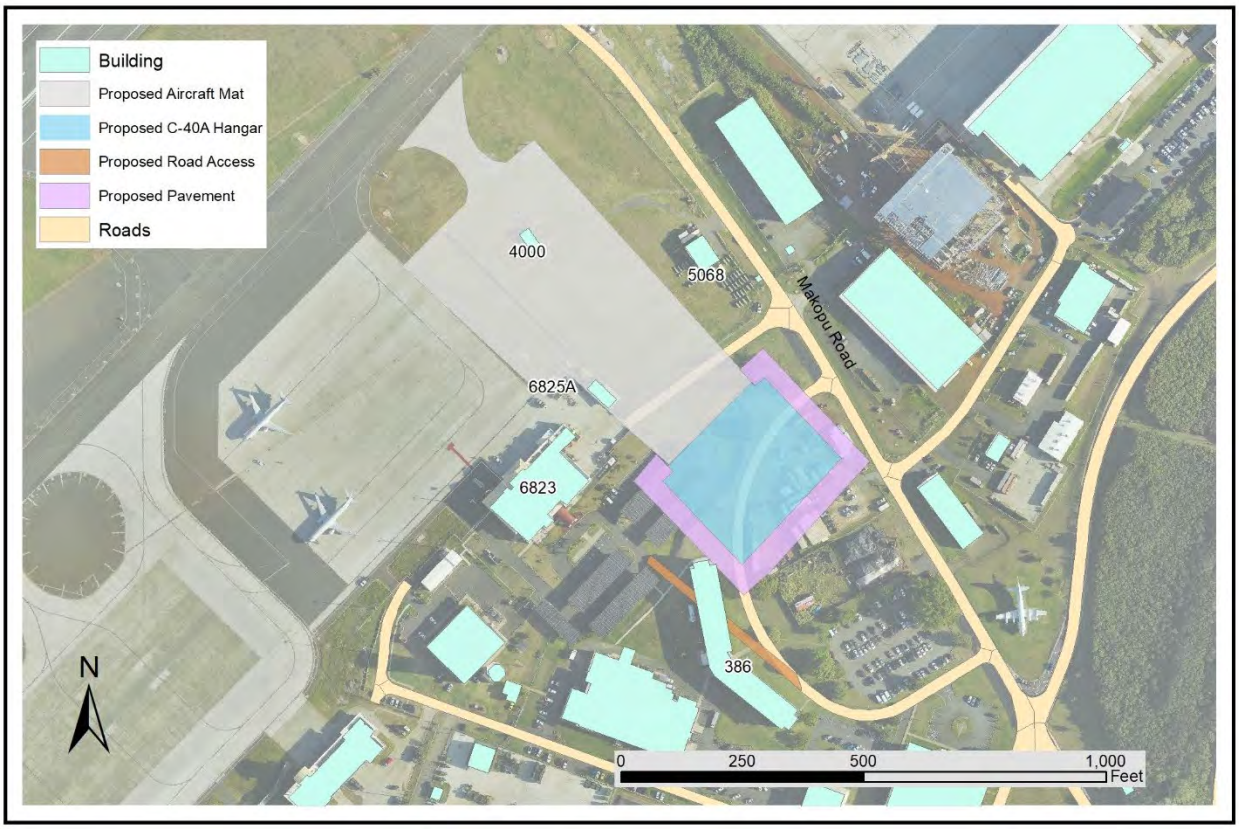


Figure 2-4. Proposed Hangar and Mat Layout at the Green Field Site.

The site layout for the hangar would also need to allow for unobstructed view from the existing air traffic control tower to all aircraft operating positions on the airfield (runways, taxiways and aprons) in accordance with Unified Facilities Criteria (UFC) 3-260-01 Airfield and Heliport Planning and Design, Appendix B Section 16. The location of the proposed hangar in Figure 2-4 reflects the necessary setback for the tower to view all operating positions. The apron would lie partially within the NAS Kaneohe Aviation Historic District.

To achieve the necessary airfield and force protection setbacks, the proposed hangar footprint would overlap or conflict with existing infrastructure, requiring demolition of the following:

- Approximately 84 parking spaces within the existing covered parking for the MCAS Terminal (approximately 60 percent of the facility's parking) and the building's access road (A Street)
- A 1,100 sf- storage building (4000)
- A 1,400 sf mechanical building (6825A)
- The 2,700 sf Aircraft Rescue Halon Reclamation building (5068)
- A portion of Crescent Drive and the 19,200 sf Bachelor Enlisted Quarters (BEQ) (Building 386) (Building 386 is slated for demolition under a larger project to construct two new BEQs, but a new hangar on this site may require acceleration of the demolition timeline).

Additionally, existing utilities and roads would also be affected, requiring relocation or redesign as described below:

- Potential re-routing of a pressurized wastewater main line that runs in a northwest-southeast direction through the Green Field Site.

- Potential impact to Mokapu Road due to the need for fire lanes and standoff around the hangar. In addition, the road may be impacted by the airfield safety requirements for clearance from the aircraft parking apron and peripheral taxiway. Relocation of the road could impact adjacent facilities including two large and one smaller warehouse facilities.

- Relocation of utility lines will also be required. A main sewer, primary electrical, and potable water lines traverse the proposed hangar and apron site and will need to be move prior to construction. In addition, these lines will require reinforced protection where they run under the proposed parking apron to ensure they are not impacted by the heavy C-40A aircraft that will utilize this area.

MCBH evaluated the Green Field Site (Alternative 2) for the proposed location of a new Type II hangar for a MV-22 squadron in the Final EA for Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130 Marine Aerial Refueler Transportation Squadron at MCBH (MCBH, 2022A). While the Green Field Site was not found feasible for the Type II hangar and eliminated from detailed analysis, the site was considered a possible site for a KC-130J Aircraft Direct Refueling System.

Aircraft maintenance hangar design is guided by UFC 4-211-01 (WBDG, 2021). Under this criteria, the Type II hangar interior is nearly twice as wide as a Type III hangar (325 feet versus 165 feet). According to the Home Basing EA, the Type II hangar would have displaced several existing large facilities and required a major re-routing of Mokapu Road at the Green Field Site. Conversely, the footprint of a Type III hangar (which is generally square in shape) would be better suited for the site. While a Type III hangar for VR-51 on the Green Field Site would displace utilities and require costly infrastructure demolition and replacement elsewhere, the site is not considered infeasible.

Additionally, there was concern raised in the Final EA for Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron that the Type II hangar's aircraft apron would be in close proximity to other large commercial and military aircraft, creating conflicts with jet blast, wingtip clearance and personnel/equipment movement (MCBH, 2022A). However, VR-51 operates only two aircraft and its associated aircraft apron at the Green Field Site and could be constructed of a size and configuration to avoid operational conflicts with surrounding aviation facilities. To connect the proposed hangar to other parking aprons and the runway, up to 4.3 additional acres of aircraft mat would be required.

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

Additional alternatives were considered, but eliminated from further evaluation because they did not fulfill the minimum objectives and screening criteria to achieve the purpose and need for the Proposed Action as detailed in Table 2-1.

Table 2-1. Alternatives Considered but Eliminated from Further Study

Name of Alternative	Why alternative was excluded
Alter Hangar 104	Raising the roof line or creating cut-outs in the door would not meet all the required structural requirements to accommodate a C-40A aircraft inside Hangar 104. Major renovation to the structural system would be needed, such as removal of the bay structural column supports, replacing the structural roof framing, raising the roof, replacing the hangar door and structural wall framing and replacing the bay's concrete floor. Reconfiguration of interior spaces would also be needed to provide the required aircraft clearances and to meet VR-51's operational/admin requirements. Alternation of the hangar to such a large extent would essentially require dismantlement and the original features of the building would be lost. This option would be costly and take more time than new construction and would not preserve the historic elements and integrity of the hangar.

Name of Alternative	Why alternative was excluded
West Field Site, MCBH (A largely undeveloped site north of the runway, east of Taxiway F and adjacent to Sumner road)	The site, which is comprised of aging asphalt and sparse vegetation, would not provide adequate land outside of the runway clear zone and explosive safety distance arcs. It would also interfere with operation of the airfield's Compass Calibration Pad. These calibration pads must be located in magnetically quiet zones free of any magnetic influences, which include large structures with metal siding and roofs (WBDG, 2019). The West Field Site meets criteria 1 and 3, but does not meet criteria 2a and 2b in Section 2.2.
Perimeter Road Site, MCBH (A largely cleared 3.2 acre site designated as a contractor lay-down area to the east of Perimeter Road and south of Sumner Road)	Use of this site would require re-routing Perimeter Road and extensive construction of airfield pavements. The location would increase worker vehicle trips across an active airfield which poses a safety hazard. The site would also lie between with two active helicopter and fixed wing flight paths (a high accident potential zone). The site is located in a tsunami evacuation zone and partially in a high-probability flood zone, which poses risks of property damage and safety risks. The Perimeter Road Site meets criteria 1 and 3, but does not meet criteria for 2a and 2b in Section 2.2.
Marine Corps Training Area Bellows (MCTAB), located on the Eastern edge of Oahu, in Waimanalo	MCTAB does not have operable fixed wing aircraft runways. The Marine Corps acquired the majority of the land from the Air Force in 1999. Since then, the property serves as a training and maneuver space to conduct amphibious, helicopter and motorized exercises. The former runway is now occupied by a forward operating base mock-up with 74 buildings and the remnants of the runway and taxiways have been unmaintained for decades, leaving only broken and crumbled asphalt. Essentially, to accommodate the VR-51, the runway would need to be entirely reconstructed and lengthened by at least 500 feet, at an exorbitant cost (in addition to the cost of the hangar). This option does not meet screening criteria 3 in Section 2.2 because the site does not have an operable runway for C-40A aircraft.
Move VR-51 to Barbers Point, Oahu; new hangar construction	The Navy has consulted the U.S. Coast Guard (USCG) and the State Department of Transportation (DOT), who both control portions of land on Barbers Point. The USCG indicates they have neither hangar space nor available land for this project (Dunlap, 2022). Similarly, the Property Manager with the State DOT stated there was no available land for this project (Fujioka, 2022). Additionally, the secure communications network at USCG Barbers Point is not compatible with the Naval Force Secure Requirement. The Barbers Point option met criteria 1, but not criteria 2 and 3 in Section 2.2.
Move VR-51 to Joint Base Pearl Harbor Hickam (JBPHH); new hangar construction	The JBPHH Site Survey Report prepared in 2017 by Boeing Global Services for VR-51 identified four hangar site options. The sites included building over Installation Restoration (IR) sites/inactive landfill areas or at locations that are a long distance away from the proposed C-40 aircraft parking area. The Air Force also looked at Hickam to bed down the KC-46 aircraft. Locations for the KC-46 hangar and parking apron overlap much of the options reviewed in 2017. The survey looked at use of existing hangars, but availability was limited and squadron offices would need to be located away from the operational hangar. The way aircraft maintenance is done at MCBH is more in line with how VR-51 prefers to operate. At JBPHH, towing of the aircraft in and out of the hangar (crossing red lines) requires consultation/ coordination with Air Force police/security for every movement resulting in operational inefficiency. Constructing a hangar at Hickam Airfield would require the relocation of VR-51 from MCBH, where it is currently established. New Construction at JBPHH met criteria 1 and 3, but not criteria 2 in Section 2.2.
Wheeler Air Force Base (AFB), Oahu	Wheeler Army Airfield is a military-controlled airfield. Its 5,600-foot runway is minimally adequate to accommodate the C-40A's 5,500-foot take-off distance. However, Wheeler Army Airfield lacks existing hangar space for new aircraft; has an insufficient amount of undeveloped land to accommodate the minimum footprint for a new hangar, apron, and supporting facilities; and the airfield is fully developed and committed to other aircraft operations. Federal Aviation Administration information for the airfield describes it as located in an extremely noise sensitive area (AirNav, 2023). Wheeler Army Airfield does not have a secure communications network compatible with the Naval Force Secure Requirement. New construction at Wheeler AFB meets criteria 1, but not criteria 2 and 3 in Section 2.2.
Dillingham Military Reservation, Oahu	Dillingham Military Reservation is not a military-controlled airfield. The U.S. Army currently leases the property to Hawaii DOT, which manages the airfield for predominantly general aviation purposes. The lease does not allow for construction and operation of the VR-51 infrastructure, and HDOT has given no indication it is receptive to modifying its lease. Dillingham 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 C-40A at 171,000 pounds (maximum take-off weight); per Federal Aviation Administration (FAA), the Dillingham runway is rated for 152,000 pound gross weight for dual-wheel aircraft (FAA, 2023). The entire

Name of Alternative	Why alternative was excluded
	runway would require demolition and reconstruction to accommodate the weight of C-40A aircraft. The airfield is also unlighted with no control tower. The airfield is fully developed and committed for general aviation operations and lacks enough undeveloped acreage for construction of a new hangar. The site does not have a secure communications network or secure facility access. New construction at Dillingham Military Reservation would not meet any of the three screening criteria under Section 2.2.

Notes: DOT= Department of Transportation; IR = Installation Restoration; FAA = Federal Aviation Administration JBPHH= Joint Base Pearl Harbor Hickam; MCHB = Marine Corps Base Hawaii; USCG = United States Coast Guard;

2.5 Best Management Practices and Conservation Measures

Best Management Practices (BMPs) and conservation measures reduce potential impacts by avoiding, minimizing, or eliminating impacts. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, and processes. They generally apply to construction practices and methods to achieve compliance with regulations.

Conservation measures are similar to BMPs but the term is typically used in the context of protecting and conserving natural resources, such as protected species.

Both are distinguished from proposed mitigation measures because BMPs and conservation measures are inherently part of the Proposed Action. Recognition of these practices prevents unnecessarily evaluating impacts that are unlikely to occur. Tables 2-2 and 2-3 list BMPs and conservation measures the Navy would implement as part of the Proposed Action.

Mitigation measures are identified as part of this EA when routine measures are not deemed sufficient to reduce effects. Mitigation measures are discussed in Section 3 under respective resource areas.

Table 2-2. Best Management Practices during Construction Activities

Conservation Measure	Impacts Reduced/Avoided	Description
Dust	Reduce particulate matter pollution	Use of water or compliant palliatives for control of fugitive dust. All construction activities would comply with the provisions of Hawaii Administrative Rule (HAR) 11-60.1-33, Fugitive Dust.
Storm Water Management	Minimize pollutants in storm water flows	Filter socks around and filter fabric inside the storm drains would be installed to prevent pollutants from getting into the storm system. 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. At contractor trailer/staging areas, the construction entrance and exits would be stabilized, boundary fencing would include fabric, filter socks around perimeter, and/or silt fence.
Storm Water Low Impact Development (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 to manage storm water for new areas of impervious surface. Features such as underground chambers and pervious pavement should be considered as LID for water management beyond the construction period.
Storm Water Permit Requirements	Minimize pollutants in storm water flows	Requirements of the NGPC required for the discharge of storm water associated with construction activity, including a Storm Water Pollution Prevention Plan (SWPPP) (complying with the MS4 permit and HAR 11-55, Water Pollution Control).
Storm Water Detention Basin	Minimize attraction of birds	A detention basin would be constructed to manage any increase in storm water runoff. It would be covered in a manner to avoid attracting birds.
Use of non-PFAS/PFOA fire protection system	Minimize water contamination from spills	Hangar design would comply with UFC 4-211-01, Aircraft Maintenance Hangars (WBDG, 2021).), which calls for a Low Level Water fire protection system in lieu of a PFAS/PFOA Aqueous Film Forming Foam (AFFF).

Notes: AFFF= Aqueous Film Forming Foam; HAR= Hawaii Administrative Rule; LID = Low Impact Development; NPDES = National Pollutant Discharge Elimination System; PFAS = Per- and polyfluoroalkyl substances; PFOA =Perfluorooctanoic Acid; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service.

The MCBH Integrated Natural Resources Management Plan (INRMP) (MCBH, 2017) includes general conservation measures that are routinely applied to construction projects and facility operations. With the effects of lighting on seabirds and marine life becoming more pronounced in recent years, MCBH finalized a series of exterior lighting conservation measures in April 2022 which was revised in February 2023 (MCBH, 2022B). Informal consultation with USFWS, Pacific Islands Office was conducted under Section 7 of the ESA for the Proposed Action's potential impacts to ESA-listed species (see Appendix C for correspondence). USFWS Pacific Islands Office stated that with the incorporation of conservation measures, effects to listed species are either too small to be meaningful or measurable, or extremely unlikely to occur. Table 2-3 describes the conservation measures that would be applied to the Proposed Action.

Table 2-3. Conservation Measures

Conservation Measure	Impacts Reduced/ Avoided	Description
Windows	Minimize attraction of birds	Windows facing or adjacent to the flight line that have the potential to attract birds to the flight line would be designed to minimize their attraction, including use of tinted glass or film with a visible light transmittance value of 30 percent or less (inside to outside).
Hangar Doors	Minimize attraction of birds	Aircraft hangars would not use translucent doors or have windows. The hangar doors would be solid and not allow any interior light to pass through. If a hangar door has a window requirement, tinting is recommended.
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.
Lighting	Bird/bat disorientation/ fallout	Exterior lighting would follow MCBH standards (MCBH, 2022B). 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 International Dark Sky Association (IDA) standards unless otherwise required by the military mission, per the MCBH INRMP (MCBH, 2017). New and renovated buildings along the flight line should follow lighting requirements to the maximum extent feasible to prevent seabirds from being attracted to areas with aircraft operations. These include: • Shielded exterior lighting (points downward) and full cutoff. • Set controls to be "On" when needed and have ability to shut off lighting when not in use. • 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. • Affix 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.

Conservation Measure	Impacts Reduced/ Avoided	Description
		• During the New Moon phases (skies are dark) and high wind days, hangar bay doors must remain closed and where possible, reduce exterior lighting around buildings to prevent the attraction of birds.
Lighting	Minimize attraction of birds	Limit use of lights during the seabird fledging period.
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.
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.
Fencing	Minimize hoary bat entanglement	The proposed fencing would not consist of barbed wire fencing that could entangle foraging Hawaiian hoary bats.
Education	Minimize indirect effects to ESA-listed species from contractors, personnel, and dependents	All construction contractors and aircraft squadron personnel would participate in MCBH's existing natural resources education program. The program would include, at a minimum, the following topics: (1) occurrence of natural resources (including Endangered Species Act (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	Minimize Hawaiian Waterbirds attraction	During construction areas of standing water will be eliminated to minimize attraction of waterbirds.
Construction	Minimize Hawaiian Waterbirds interaction	During construction, in areas where waterbirds are known to be present, reduced speed limits will be posted and implemented, and project personnel and contractors will be informed about the presence of endangered species on-site.
Construction	Minimize indirect effects of waterbirds	If a waterbird nest or active brood is found within in the project site, the following actions will be taken: 1) Notify USFWS within 24 hours, 2) Establish a 100-ft buffer around all active nests, 3) Employ a Biological Monitor during construction activities until the chicks fledge.

Notes: ESA = Endangered Species Act; IDA = International Dark-Sky Association; INRMP = Integrated Natural Resources Management Plan; NOAA = National Oceanic and Atmospheric Administration; USFWS = United States Fish and Wildlife Service.
* "No brighter than necessary" means to eliminate excessively bright lights and light the area well enough to accomplish the task at hand while reducing or eliminating, back light, uplight, and glare to the maximum extent possible.

2.6 Mitigation Measures

Mitigation measures are measures the Navy may decide to undertake to reduce or offset anticipated adverse effects. Mitigation measures are discretionary, and if implemented, would address specific effects of the proposed action and its alternatives identified during the environmental analysis. CEQ requires mitigation measures to be monitored and enforced as stated in the FONSI.

The Navy is in consultation with the SHPO to develop a Memorandum of Agreement (MOA), which is anticipated to include mitigation measures based on the analysis of effects to cultural resources identified in this EA. Through the development of this MOA, DON, and the SHPO would mutually agree on mitigation measures that would be included in the final decision document.

3 Affected Environment and Environmental Consequences

This section presents a description of the environmental resources and baseline conditions that could be affected from implementing the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, the Council on Environmental Quality, and Department of Navy guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

This section addresses air quality, water resources, biological resources, natural hazards and resiliency, cultural resources, infrastructure, hazardous materials and waste, and noise.

The potential impacts to the following resource areas are considered to be negligible or non-existent and were not analyzed in detail in this EA:

- Geological resources: The Proposed Action would construct a hangar, parking apron, and provide utility connections. Although soils would be disturbed during construction, implementation of BMPs for soil conservation and storm water management would result in negligible impacts to soils.

- Visual resources: Separate and apart from that discussion of historic impacts, the visual effects of constructing a new hangar within the airfield area is compatible with the existing developed airfield area.

- Land Use: Under the Proposed Action, a hangar and associated aircraft parking apron would be constructed within the Airfield Area of MCBH at either the Hangar 104 Site or Green Field Site. The Proposed Action at either site alternative would be compatible with airfield operations. Both sites were pre-evaluated for land use compatibility under the criteria in Section 2.2.

- Airspace: Under the Proposed Action, there would be no change in airspace designation or use. The Proposed Action would not include any changes to VR-51 operations that would result in adverse effects to airspace. Currently VR-51 aircraft operations represent one percent of annual MCBH operations.

- Transportation: Under the Proposed Action, there may be temporary increases in construction-related traffic from material transport and commuting of construction workers. From analysis of other MCBH hangar construction projects (MCBH, 2022A), construction traffic for the Proposed Action would be less than one percent of average daily traffic volume on H-3 and would pose a negligible effect on traffic. A discussion of the cumulative effects of traffic are provided in Section 4.

- Socioeconomics: The entire Proposed Action is located exclusively on MCBH. Personnel levels in support of the VR-51 mission would not be increased under the Proposed Action. Construction may provide minor temporary beneficial impacts to the local economy in terms of construction-related jobs and purchasing, but no long term effects would occur.

3.1 AIR QUALITY

This discussion of air quality addresses criteria pollutants, standards, sources, and permitting. 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.

3.1.1 Affected Environment

The air quality region of influence includes the east side of the island of Oahu in Honolulu County, where MCBH is located, and the State of Hawaii for climate change effects. The latest data from the Department of Health (DOH, 2023) indicates the state is in attainment except for exceedances for sulfur dioxide (SO_2) and particulate matter less than or equal to 2.5 micrometers in diameter ($PM_{2.5}$) in communities near the volcano on Hawaii Island (DOH, 2023), which is considered by the U.S. Environmental Protection Agency (EPA) 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 MCBH generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators.

As noted in Section 2.5, all construction activities on MCBH would comply with the provisions of Hawaii Administrative Rule (HAR) 11-60.1-33, Fugitive Dust. Relevant provisions to the Proposed Action include but are not limited to:

- Use of water or suitable chemicals for control of fugitive dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land;
- Covering all moving, open-bodied trucks transporting materials which may result in fugitive dust;
- Prompt removal of earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means.
- No operating a diesel-powered motor vehicle which emits visible smoke for a period of more than five consecutive seconds while upon streets, roads, or highways.

3.1.2 Environmental Consequences

This analysis evaluates the effects on air quality based on estimated direct and indirect emissions associated with the action alternatives and no action alternative.

Because the state of Hawaii is in attainment of the NAAQS, the action alternatives are not subject to the CAA's General Conformity Rule. Construction activities during implementation of the action alternatives would generate short-term, temporary air emissions such as fugitive dust and combustion of fossil fuels from construction equipment. Proposed operations would result in short, intermittent air quality impacts due primarily to the addition of C-40A aircraft operations; however, all emissions are below Prevention of Significant Deterioration (PSD) thresholds and would not affect the state of Hawaii and the island of Oahu's NAAQS attainment status.

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 air quality.

3.1.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Construction Impacts

The bulk of the proposed construction and demolition activities would be related to aircraft hangars and pavement. The proposed construction activities are anticipated to occur over 25 months.

This analysis first determined the type and quantity of equipment necessary to construct the Proposed Action. 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), particulate matter (PM) less than or equal to 10 micrometers in diameter (PM_{10}), carbon monoxide (CO), sulfur dioxides (SO_x), and carbon dioxide (CO_2) related to heavy-duty diesel equipment and on road trucks and commuter vehicles. The earth disturbance related fugitive dust emissions were estimated based on the areas with potential ground disturbance. VOCs from asphalt paving were also calculated. Table 3.1-1 summarizes the predicted annual construction emissions for the Hangar 104 Site. Appendix E details the calculations, assumptions and reference material supporting the results in Table 3.1-1.

Table 3.1-1. Alternative 1- Hangar 104 Site Estimated Construction Emissions

	Emissions (tons)[1]					
Year	**NO_x**	**VOCs**	**PM_{10}**	**CO**	**SO_2**	**CO_2**
2025	2.30	2.96	1.07	8.45	0.22	168.31
2026	3.07	3.95	1.43	11.27	0.29	224.41
2027	1.02	1.32	0.48	3.76	0.10	74.80
Total	**6.39**	**8.22**	**2.97**	**23.47**	**0.60**	**467.5 tons** (0.000424 MMT)
PSD Thresholds	**40**	**40**	**15**	**100**	**15**	**NA**

CO = carbon monoxide; CO_2 = carbon dioxide; MMT =Million metric tons; NOx = nitrogen oxides; PSD = Prevention of Significant Deterioration; Particulate Matter (PM: PM_{10} are particles with aerodynamic diameters less than or equal to a nominal 10 micrometers); SO_2 = sulfur dioxide; VOC = Volatile Organic Compound; NA=Not applicable.
Note 1: Emissions related to the construction of parking structures along First Street is discussed in cumulative effects and not accounted here, as that project would have proceeded without this hangar alternative and would occur later in time.

The CAA Prevention of Significant Deterioration (PSD) Program applies to major stationary sources of air pollutants and requires a determination that a source 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 3.1-1 are used to determine de minimis emission rates for attainment areas within the region of influence. Annual construction emissions for the project would be far below de minimis levels and would not affect the maintenance of local air quality standards.

Implementation of construction site BMPs would minimize emissions and dust (See Table 2-2). These include proper maintenance and management of construction vehicles and equipment and dust control measures, such as erecting dust screens around the construction site and dust suppression of exposed soils with water. Dust can be further minimized by landscaping areas of bare earth as soon as practicable. The effectiveness of dust control BMPs during construction can vary. Sprinkling exposed ground with water until it is moist is effective for dust control at most sites. Mulching can reduce wind erosion by 75 to 95 percent Wind breaks provide barriers that can reduce the velocity of wind through a site to reduce dust (EPA, 2021).

Overall, implementation of project BMPs would also provide moderate to high reduction of airborne dust (PM_{10}) in the project area during construction reducing adverse effects from dust to less than significant levels.

Carbon Dioxide

The construction-phase of the project would release approximately 468 tons of CO_2 over the duration of construction. These emissions are based on worker commuting, material transport, and construction equipment operation. According to the Hawaii Greenhouse Gas Emissions Report for 2017 (April, 2021),

emission from all sectors in 2017 was 20.6 million metric tons (MMT) in CO_2 equivalent. To put this in context, the project would emit less than 0.002 percent of Hawaii annual CO2 equivalent.

Embodied carbon refers to the CO_2 emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. In particular, cement/concrete and steel manufacturing processes emit large amounts of CO_2, meaning they have a high carbon footprint. The building would be steel-frame construction with steel corrugated siding. Concrete, whose manufacture has a high carbon footprint, would be used in the foundation, floors, and sidewalks.

While estimating embodied carbon for all construction materials would be unwieldy, a rough estimate of embodied carbon associated with steel and concrete, the primary construction materials for a Type III hangar, is provided in Table 3.1-2. These calculations do not take into consideration any offsets associated with recycling demolition debris from other structures or pavement except for steel from Hangar 104.

Table 3.1-2. Embodied Carbon Associated with Construction of a Type III Hangar

Material	Estimated Construction Amount	Estimated Embodied Carbon per unit measure	Estimated total CO_2-equivalent, tons
Concrete -Traditional	6700 cy	400 lbs/cy	1,340 tons
Alternative Low CO_2 Concrete	6700 cy	375 lbs/cy	1,256 tons
Structural Steel	200 tons	1.74 tons/ton	348 tons
Structural Steel recycled (Hangar 104)	200 tons	-0.93 tons/ton	186 tons avoided

Notes: Lbs= pounds; cy = cubic yard;
Sources: PCA, 2023; Carbon Cure, 2023; NSC, 2021

On Oahu, there is a ready mix concrete provider that uses carbon reduction technology (post-industrial carbon dioxide mineralized concrete) that could reduce pollutants associated with concrete production for the project by 84 tons (6 percent) if utilized. This option would need to be added to the design specification for the project to be incorporated.

As discussed in Section 3.7.1.1, the PVT landfill includes source separation of recyclable construction waste. If all the structural steel associated with demolishing Hangar 104 were recycled, the net embodied carbon footprint for steel would be reduced by over 50 percent, from 348 tons to 162 tons.

Alternative 1 would demolish airfield hangar and two ancillary buildings and construct a new hangar. The proposed hangar is not expected to be a significant stationary source of emissions. Therefore, the action at the Hangar 104 Site would not result in significant long-term impacts on air quality.

Operational Impacts

Alternative 1 would introduce new air emission sources via the transition of C-40A aircraft; however, emissions from the C-20G aircraft would be reduced. Table 3.1-3 summarizes the estimated number of sorties pre and post C-40A transition at MCBH.

Table 3.1-3 Annual Aircraft Operations and Engine Maintenance Activities

	C-20G Aircraft	C-40A Aircraft
	Sorties*	Sorties*
Pre-Transition	853	0
Post-Transition	427	113

*Each sortie generates one departure, one arrival, and closed pattern events count as two tower operations.

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, this analysis estimated the change in aircraft operation air pollutants emissions using the applicable emission factors provided by the Air Force's Air Emissions Guide for Air Force Mobile Sources (Air Force Civil Engineer Center, 2020). Table 3-4 summarizes the calculated change in aircraft emissions from C-20 to C-40A aircraft.

Table 3.1-3 Net Change in Aircraft Emissions

	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)						
		VOC	NO_x	CO	$PM_{2.5}$	PM_{10}	SO_2	CO_2
C-20G	13,730	6.220	46.1	29.5	1.550	1.720	4.28	12858.36
C-40A	19,349	3.120	60.3	25.2	0.280	0.300	4.28	12858.36
Total Net Change	**-5,619**	**3.1**	**-14.2**	**4.3**	**1.270**	**1.420**	**0**	**0**

Source: Air Force Civil Engineer Center, 2020
Legend: CO= carbon monoxide; CO2= carbon dioxide; NOx = nitrogen oxides; Particulate Matter (PM**:** PM_{10} and $PM_{2.5}$ are particles with aerodynamic diameters less than or equal to a nominal 10 and 2.5 micrometers, respectively); S02 = sulfur dioxide; VOC= Volatile Organic Compound.

Proposed operations would result in short, intermittent air quality impacts on base due primarily to the addition of C-40A 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 MCBH quickly disperse air pollutants. Therefore, Alternative 1 operations would have less than significant impacts to air quality.

3.1.2.3 Alternative 2- Green Field Site

Construction Impacts

The analysis of air emissions for construction at the Green Field Site follows the same process as described in 3.1.3.2. Table 3.1-3 provides the anticipated construction emissions for the Green Field Site. The emissions calculations are provided in Appendix E. The emission calculations take into account relocation of utilities and roads, demolition of affected buildings and structures, and other site preparation work. While replacement of facilities and infrastructure relocation would need to be phased over a longer period of time, the air emission calculations assume these actions would occur over a period of 25 months.

Annual construction emissions for the project would be far below PSD thresholds (used as a surrogate for de minimis levels) and would not affect the maintenance of local air quality standards.

Table 3.1-3. Alternative 2- Green Field Site Estimated Construction Emissions

	Emissions (tons)[1]					
Year	**NO_x**	**VOCs**	**PM_{10}**	**CO**	**SO_2**	**CO_2**
2025	2.48	4.71	1.09	8.92	.30	102.75
2026	3.31	6.27	1.45	11.89	0.40	136.99
2027	1.10	2.09	0.48	3.96	0.13	45.66
Total	**6.90**	**13.07**	**3.02**	**24.78**	**0.782**	**285.4**
PSD Thresholds	40	40	15	100	15	NA

CO = carbon monoxide; CO_2 = carbon dioxide; NOx = nitrogen oxides; PSD = Prevention of Significant Deterioration; Particulate Matter (PM: PM_{10} are particles with aerodynamic diameters less than or equal to a nominal 10 micrometers); SO_2 = sulfur dioxide; VOC = Volatile Organic Compound; NA=Not applicable.
Note 1: Emissions related to the demolition of the Bachelor Enlisted Quarters and its reconstruction elsewhere are not accounted here, as that project would have proceeded without this hangar alternative.

The primary differences between the site alternatives is that there would be less demolition-related emissions for the Green Field Site, but greater site preparation emissions for the Green Field Site, such as demolition, grading, utility relocation/trenching, and up to 2.6 more acres of airfield mat and other pavement installed. The reduced demolition (and truck transport to haul away debris) under the Green Field Site alternative avoids approximately 180 tons of CO_2 emissions when compared to the Hangar 104 Site.

The embodied carbon associated with new construction of the hangar would be similar to that under the Hangar 104 Site. The only difference would be that there would be potential to offset embodied carbon from any recycling of demolition material under the Hangar 104 Site.

Operational Impacts

The operational impacts for Alternative 2 are the same as described above for Alternative 1.

3.1.3 Mitigation Measures

No mitigation measures would be required for air quality.

3.2 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.

3.2.1 Affected Environment

The project area is the construction footprint of the site alternatives and immediately adjacent lands. The region of influence for water resources includes the site alternative locations, as well as the adjacent marine waters where applicable. Figure 3.2-1 shows the water features in the region of influence.

3.2.1.1 Marine Waters

HAR 11-54, Water Standards, classifies Kaneohe Bay as marine water quality Class AA (DOH, 2021), which is defined as 'uniformly good to excellent natural quality'. Fresh water enters this portion of Kaneohe Bay from rainfall, intermittent small streams, and surface drainage. 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.

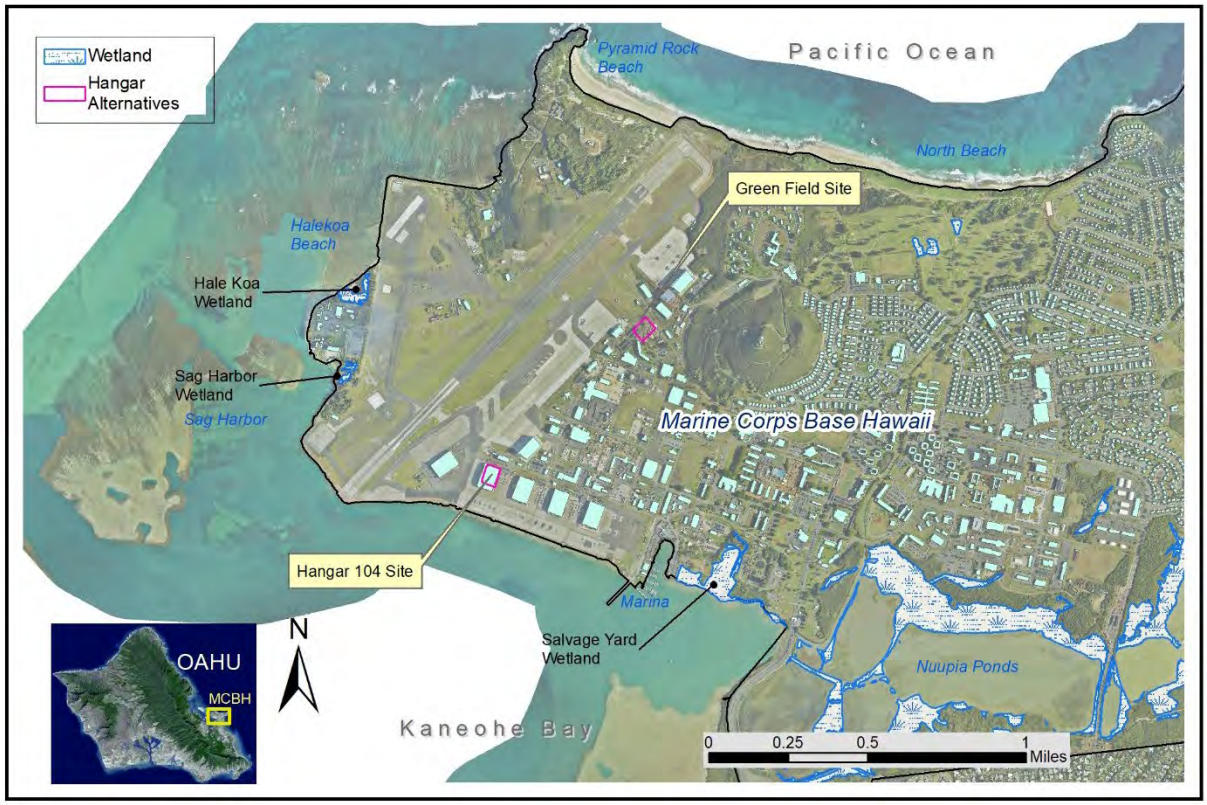


Figure 3.2-1. Water Resources at MCBH

The Alternative 1 Site is located adjacent to the Bravo Ramp, approximately 500 feet from the marine waters of Kaneohe Bay. The Alternative 2 Site is located over half a mile from the closest marine waters of Kaneohe Bay.

The MCBH Kaneohe Bay Water Reclamation Facility discharges treated wastewater to the Kailua Bay (Class A Water) ocean. The facility received a Notice of Violation from the DOH in May 2022 for exceeding NPDES permitted effluent discharge limitations on several occasions between August 2020 and February 2022. As discussed in Section 4, a planned project to upgrade and provide redundancy for the wastewater treatment plant would improve water quality and ensure adequate capacity for planned projects. This project will be awarded in 2025 and is expected to be in 2028/2029.

3.2.1.2 Groundwater

The proposed project areas are 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 site alternatives, 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 of brackish basal groundwater (Mink and Lau, 1990; Stearns and Vaksvik, 1935; U.S. Geological Survey, 1968).

Neither site alternative overlaps any known contaminated groundwater sites. Groundwater is generally encountered between 5.5 and 7 feet below ground surface. Given the uses of the sites for aviation operations for several decades, it is possible soil or groundwater contamination could be encountered.

3.2.1.3 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 Hawaiiloa sub-watershed. Rainfall averages 40 inches per year (Rainfall Atlas of Hawaii, 2022). There are no freshwater surface waters within in the project area. The closest surface water to the Proposed Action occurs at the Nuupia Ponds Complex, an estuarine system over 1 mile southeast of the site alternative locations.

3.2.1.4 Wetlands

Figure 3.2-1 depicts wetlands in relationship to the action alternatives. Wetlands generally include "swamps, marshes, bogs and similar areas." Eight protected wetland complexes are located at MCBH. The Alternative 1 Site is approximately half a mile southeast of the closest wetland (Sag Harbor). Alternative 2 is approximately 0.7 miles from the Hale Koa Wetland.

3.2.2 Environmental Consequences

This analysis focuses on the potential impacts of the Proposed Action on marine waters and groundwater. The proposed hangar's wastewater discharges would tie into the existing wastewater treatment system on MCBH. Groundwater analysis focuses on the potential for impacts to the quality, quantity, and accessibility of groundwater; and marine water quality considers the potential for impacts to improve or degrade current water quality.

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 water resources.

3.2.2.2 Alternative 1 - Hangar 104 Site (Preferred Alternative)

Construction Impacts

The Navy would demolish Hangar 104 and construct a smaller Type III hangar within its existing footprint. The site is currently surrounded by airfield pavements and asphalt parking lots. A portion of the airfield pavement and surrounding parking lot and infill areas (approximately 3.7 acres total) would be replaced. The proposed project would be constructed with LID elements and appropriate conservation measures to the maximum extent technically feasible in accordance with UFC 3-210-10, Low Impact Development, as applicable.

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 Notice of General Permit Coverage (NGPC) from the State of

Hawaii Department of Health (DOH) for a Notice of Intent – Construction will be required. The project will adhere to MCBH's existing permits and compliance agreements including:

- NPDES No. HIS000007 (MS4 Stormwater)
- NPDES No. HI0110078 (Wastewater)
- 2022 Federal Facilities Compliance Agreement between the U.S. EPA and the U.S. Marine Corps

Application of BMPs described in Table 2-2 for storm water, along with the additional NPDES permit conditions and LID site design features, would minimize runoff and any 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. With the use of BMPs, adverse effects to stormwater quality would be minor. Construction and operations would likely not affect wetlands.

Hangar 104 currently has a water only deluge fire sprinkler system for the hangar bay area and wet-pipe fire sprinkler systems for the office/shop areas. Aqueous Film Forming Foam (AFFF) is no longer allowed for use in fire response systems, and all AFFF will eventually be removed from MCBH. There is no AFFF within the hangar that could pose a threat to groundwater or marine waters during demolition. The new hangar would comply with UFC 4-211-01, Aircraft Maintenance Hangars (DoD, 2021), which calls for a Low Level Water fire protection system in lieu of AFFF.

Operational Impacts

Operations at the hangar would include the use of minor amounts of hazardous materials to perform aircraft maintenance activities. Any hazardous material spills would be cleaned up in accordance with standard operating practices. The Hangar 104 Site and aircraft mat is located 500 feet from the marine waters of Kaneohe Bay, where any spills or releases of fuels and hazardous materials have potential to pollute the bay if unattended. The base has a robust spill reporting and response system, as outlined in the Spill Prevention and Control and Countermeasures Plan, and a Spill Contingency Plan. MCBH also has an "Environmental Standard Operating Procedures" class that occurs bimonthly. That instructs students in hazardous materials/waste handling and disposal, spill response, and storm water pollution prevention among other topics (MBCH, 2016).

As described in Section 3.2.1.1, wastewater from the hangar would be directed to the MCBH Water Reclamation Facility. There is a construction contract underway to modify the Water Reclamation Facility to upgrade the capacity and to add redundancy to components to ensure final effluent quality complies with State permitting requirements. The proposed hangar is anticipated to be completed after completion of the wastewater facility upgrades. The hangar design would also incorporate water-saving fixtures to reduce wastewater flow. Overall, the potential for adverse effects from wastewater would be low.

With the use of BMPs for spill avoidance and response, storm water protection, and the use of a non-PFAS fire protection system in the hangar, operating a new hangar on the Hangar 104 Site would have less than significant impacts to marine waters and groundwater resources.

3.2.2.3 Alternative 2- Green Field Site

Construction Impacts

During site preparation for project construction, the Navy would demolish three buildings, relocate existing buried utility lines, and demolish a portion of the MCAS Terminal parking lot. Up to 8 acres of new impervious surface would be added when compared to the baseline. To offset potential stormwater runoff,

Low Impact Design (LID) practices would be needed, which could include a retention facility beneath pavements. Alternative 2 is further from shorelines and wetlands than the Alternative 1 Site, allowing for stormwater infiltration to occur from overland flow to a somewhat greater degree than the Alternative 1.

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. Construction at Alternative 2 would follow the same NPDES permitting process for Alternative 1 (described in Section 3.2.2.2) and include the application of BMPs described in Table 2-2. With the use of BMPs and LID design, adverse effects to stormwater quality would be minor.

Operational Impacts

Alternative 2 operational impacts would be the same as those under the Alternative 1 (Section 3.2.2.2). As described in Section 3.2.1.1, wastewater from the hangar would be directed to the MCBH Water Reclamation Facility. The proposed hangar would incorporate water-saving fixtures, reducing potential for overburdening the reclamation facility. Additionally, the reclamation facility improvements are slated to be completed in 2028/2029. Overall, the potential for adverse effects to marine waters from the project's wastewater would be low.

With the use of BMPs for spill avoidance and response, storm water protection, and the use of a non-PFAS fire protection system in the hangar, Alternative 2 would have less than significant impacts to marine waters and groundwater resources. Construction and operations would likely not affect wetlands.

3.2.3 Mitigation Measures

The Navy would implement BMPs to protect water quality. No mitigation measures for water resources would be necessary.

3.3 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 MCBH. 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 MCBH 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, disturbance from human activities, and changes in the noise environment.
- 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 proposed aircraft operations.

Neither site alternative under the Proposed Action would interfere with or induce effects on beaches nor their associated marine waters where ESA-listed marine species (the Hawaiian monk seal (‘ilioholoikauaua, *Neomonachus schauinslandi*) and green sea turtle (honu, *Chelonia mydas*) may be present. Accordingly, direct effects to these species are unlikely. Operational noise over marine waters of Kaneohe Bay would be virtually the same as existing conditions and there would be no effect to ESA-listed marine species. Therefore, potential impacts to marine species are not further analyzed in this EA.

3.3.1 Affected Environment

The following describes the existing conditions for the three categories of biological resources at MCBH.

3.3.1.1 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. Alternative 1 is covered with buildings and pavement, offering no vegetation cover. Alternative 2 was previously cleared with heavy equipment and lacks native vegetation cover. 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 invasive volunteer plants that outcompete native plants on the site (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.

3.3.1.2 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 MCBH including domestic/feral cats (*Felis catus*), rats (Rattus spp.), and mongoose (*Herpestes javanicus*). Hawaiian hoary bats are known to occur on Oahu although there has been no recorded presence within the project area.

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 off-shore State bird sanctuaries. 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, *Ardenna pacifica*) 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*), 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 3.3-1 and are identified by their common name, Hawaiian name, and origin (native or introduced).

Waterbirds. 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 MCBH and may occur in the region of influence, such as the permanent colony of red-footed booby (ʻā, *Sula rubripes*) in the Ulupau Head Wildlife Management Area 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 (ʻa, *Sula leucogaster*), black noddy (noio, *Anous minutus*), sooty tern (ewa, *Onychoprion fuscatus*), grey-backed tern (pakalakala, *Onychoprion lunatus*), and white-tailed tropicbird (koaʻe kea, *Phaethon lepturus*), which may overfly the project area on occasional, seasonal, or temporal basis.

Table 3.3-1. Non-ESA-Listed MBTA Species Known to Occur or with Potential to Occur in the Region of Influence.

Scientific Name	***Common Name***	***Hawaiian Name***	***Origin***
Anas platyrhynchos	Mallard	-	Introduced
Anas wyvilliana	Hawaiian duck-mallard hybrid	Koloa moali	Native
Bubulcus ibis	Cattle egret	-	Introduced
Fregata minor palmerstoni	Great frigatebird	ʻIwa	Native
Ardenna pacifica	Wedge-tailed shearwater	ʻUaʻu kani	Native
Phoebastria immutabilis	Laysan albatross	Mōlī	Native
Bulweria bulwerii	Bulwer's petrel	ʻOu	Native
Arenaria interpres	Ruddy turnstone	ʻAkekeke	Native
Sula sula rubripes	Red-footed booby	ʻĀ	Native
Sula leucogaster	Brown booby	ʻĀ	Native
Anous minutus	Black noddy	Noio	Native
Onychoprion fuscatus	Sooty tern	Ewa ewa	Native
Onychoprion lunatus	Grey-backed tern	Pakalakala	Native
Phaethon lepturus	White-tailed tropicbird	Koaʻe kea	Native
Cardinalis cardinalis	Northern red cardinal	-	Introduced
Carpodacus mexicanus	House finch	-	Introduced
Pluvialis fulva	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 cafe*r), chestnut munia (*Lonchura atricapilla*), and gray francolin (*Francolinus pondicerianus*).

3.3.1.3 Special-status Species – Federal

ESA-listed species with the potential to occur in the region of influence are listed in Table 3.3-2 and are identified by their Hawaiian name, common name, scientific name, and regulatory status.

Table 3.3-2. Special-Status Species Known to Occur or with Potential to Occur in the Project Area and Region of Influence

Hawaiian Name	Common Name	Scientific Name	Regulatory Status
ʻalae keʻokeʻo	Hawaiian coot	*Fulica alai*	FE, SE
ʻalae ʻula	Hawaiian gallinule	*Gallinula mexicanus sandvicensis)*	FE, SE
koloa	Hawaiian duck	*Anas wyvilliana*	FE, SE
aeʻo	Hawaiian stilt	*Himantopus mexicanus knudseni*	FE, SE
ʻaʻo	Newell's shearwater	*Puffinus auricularis newelli*	FT, ST
ʻuaʻu	Hawaiian petrel	*Pterodroma phaeopygia sandwichensis*	FE, SE
ʻakeʻake	Band-rumped storm petrel	*Oceanodroma castro*	FE, SE
ʻōpeʻapeʻa	Hawaiian hoary bat	*Lasiurus cinereus semotus*	FE, SE
honu	Central North Pacific District Population Segment of the Green sea turtle	*Chelonia mydas*	FT, ST
honu'ea	Hawksbill sea turtle	*Eretmochelys imbricata*	FE, SE
-	Monarch butterfly	*Danaus plexippus*	C
Nalo meli maoli	Anthricinan yellow-faced bee, Hawaiian yellow-faced bee	*Hylaeus anthracinus*	FE, SE

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.

Waterbirds. Wetlands in the region of influence provide potential habitat for ESA-listed waterbirds. These waterbirds include the endangered Hawaiian stilt (ʻaeʻo, *Himantopus mexicanus knudseni*), endangered Hawaiian duck (koloa moali, *Anas wyvilliana*), endangered Hawaiian gallinule (ʻalae ʻula, *Gallinula galeata sandvicensis*), and endangered Hawaiian coot (ʻalae keʻokeʻo, *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 MCBH, primarily at the freshwater influenced portions of the Nuupia Ponds (MCBH, 2017); however, they are also known to occur within the region of influence at Sag Harbor Wetland (MCBH, 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 MCBH are nominally in the range of 25 to 50 depending on the time of the year, with activity observed primarily at the Nuupia Ponds. Hawaiian coot are no longer commonly seen at the Klipper Golf Course Ponds (MCBH, 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, MCBH 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 (MCBH, 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 with no reported aircraft strikes to either of these species (USDA, 2021). Programs implemented under the Integrated Natural Resources Management Plan (INRMP) (MCBH, 2017) and the BASH Plan are currently in place to protect and monitor ESA- and MBTA-listed species.

Seabirds. Of the ESA-listed seabirds that have the potential to occur, the endangered band-rumped storm petrel (ʻakē ʻakē, *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 (ʻuaʻu, *Pterodroma sandwichensis*) and the threatened Newell's shearwater (ʻaʻo, *Puffinus auricularis newelli*) have been detected by sound meter surveys around the Koʻolau range; however, they have not been detected or observed in the project area or region of influence (or anywhere on MCBH).

3.3.1.4 Special-status Species – State

The land-dwelling Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) is a state-listed endangered raptor and has been documented at MCBH. Pueo occupy a variety of habitats but are most common in open habitats such as grasslands and shrublands. Pueo tend to be more active during crepuscular periods (dawn and dusk) and are commonly seen hovering or soaring over open areas. 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 (MCBH, 2017; Price Lab, 2022). No nests are documented in the airfield area; the only ones documented on base are within the Nu'upia Ponds Wildlife Management Area (MCBH, 2022A).

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no impact to biological resources at MCBH.

3.3.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Construction Impacts

Alternative 1 is devoid of vegetation, such as grass, shrubs or trees that provide suitable habitat for wildlife. The site in its current state may provide opportunistic sheltering or transient use by birds or invasive mammalian species.

Effects to Mammals

During construction, invasive mammals, such as domestic/feral cats, rats, and mongoose, could be disturbed by demolition, construction noise, and vibration. These species would likely leave the immediate area of construction to find habitat elsewhere on the installation.

With the implementation of BMPs and conservation measures, Alternative 1 would have less than significant construction impacts to bird and other wildlife habitat.

Effects to Birds

Multiple bird species (e.g., northern red cardinals and house finches) often occur within and around the hangars. The proposed hangar would be designed with netting or slanted surfaces to keep birds from nesting in the hangar. The hangar would also incorporate interior and exterior lighting conservation measures outlined in Section 2.5 to reduce or prevent seabird 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 strike hazard (BASH). For example, in the airfield area, every year during fledging (15 September through 15 December), wedge-tailed shearwaters and Bulwer's petrels require rescuing because of being impacted by light from aircraft hangars (USDA, 2021; MCBH, 2022B). 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 seabird fallout, construction would occur primarily during 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, NOAA, and/or International Dark-Sky Association standards for the type of work to be undertaken. Additional conservation measures to further reduce risk of fallout (see Table 2-5) include reducing lighting during New Moon phases during Fall-out season, 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 (MCBH, 2022B). With implementation of these measures to reduce lighting impacts, construction at the Hangar 104 Site would have less than significant impacts to birds due to fallout.

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. 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 2.5, Conservation Measures, such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins (see Table 2-3 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 would have less than significant impacts to water resources used by birds and other wildlife.

There is a slight risk of injury or death to birds due to vehicle or equipment collisions during construction. 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.

Construction noise would result in temporary impacts to birds. Construction-related noise may temporarily displace birds 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 flight line and other construction areas or would temporarily relocate from the construction areas to adjacent similar habitats. Therefore, any temporary construction noise impacts would not result in new or unique impacts to birds. Considering the temporary nature of the construction impacts, its similarity to ongoing operational noise levels, and the high degree to which wildlife at MCBH have habituated to high levels of noise associated with current activities, Alternative 1 would pose less than significant noise impacts to birds.

Effects to Federally listed, State-listed, or Special-status Species

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 MCBH's existing natural resources education program. This would minimize potential effects from personnel accessing other parts of the installation for recreation.

MCBH, on behalf of the Navy, conducted 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). MCBH submitted a Biological Assessment to the USFWS Pacific Islands Office in January 2023 that found that the project at either site location would have no effect on, or is not likely to adversely affect, any special status species (MCBH, 2023). On March 22, 2023, the USFWS Pacific Islands Office responded that with the incorporation of conservation measures, effects to listed species are either too small to be meaningful or measurable, or extremely unlikely to occur. USFWS Conservation Measures are included in Table 2-3.

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. MCBH determined in the project's Biological Assessment that hangar construction at the Hangar 104 Site 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 (see Appendix C).

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 birds including the Hawaiian duck, Hawaiian coot, Hawaiian gallinule, Hawaiian stilt, band-rumped storm petrel, Newell's shearwater, and Hawaiian petrel (refer to species listed in Table 3.3-2). Natural resource staff conduct bird counts three times annually for endangered birds and have found 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 (MCBH, 2022B). For these reasons, the Hangar 104 Site alternative 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 highly developed. 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 nor its habitat. While bats are sensitive to noise; bats are already discouraged from use of the area (Voigt et al., 2018). There would be no 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, as well as those measures targeting sediment control to reduce negative impacts from airborne particles during construction, would further reduce potential impacts to bats. The project would 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 2-3. 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. 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. 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 MCBH, but this species has not been documented within the project area or region of influence. Therefore, Alternative 1 would have no effect on the Hawaiian yellow-faced bee.

- Pueo (Hawaiian short-eared owl), State Endangered. While suitable pueo foraging habitat exists on MCBH, these areas are not within the region of influence of the Hangar 104 Site. Noise effects to pueos within the region of influence are like those described above for birds. Therefore, Alternative 1 would have less than significant impacts to the species.

Considering the temporary nature of the construction impacts, its similarity to ongoing operational noise levels, and the high degree to which wildlife at MCBH have habituated to high levels of noise associated with current activities, Alternative 1 would pose less than significant impacts to Federally listed, State-listed, or Special-status Species

Operational Impacts

The C-40 aircraft operations and functions are similar to the C-20 aircraft operations. There would not be any new or increased operational impacts to habitat in Alternative 1, thus having less than significant impacts to bird and other wildlife habitat.

Effects to Mammals

The C-40 aircraft noise is virtually the same as existing conditions. Takeoffs and landings could startle monk seals or green sea turtles if they are present; however, these events only produce noise at any given location for a very brief period as the aircraft climbs to cruising altitude. Any short-term reactions would not cause disruption of natural behavioral patterns to a point where such behavioral patterns are abandoned or significantly altered. Based on this limited interaction and the minor noise over-water, potential noise impacts to marine species would be less than significant, and there would be no effect to listed marine species.

Effects to Birds

There is a risk at airfields of strike to birds by aircraft. MCBH has a comprehensive Bird/Wildlife Aircraft Strike Hazard Plan. Existing conservation measures reduce the potential presence of birds and, therefore, minimize potential bird strike impacts associated with the proposed action. 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 C-40 operations do not introduce any new strike hazards and the base has comprehensive well-established procedures to minimize strike potential associated with aircraft operations, Alternative 1 would have less than significant impacts to birds.

3.3.2.3 Alternative 2- Green Field Site

Construction Impacts

The open space grass area associated with Alternative 2 is consistently mowed to a very low height. Therefore, the Pueo is unlikely to nest at this site, as they prefer habitats with taller grass.

Hawaiian ducks and Hawaiian Stilts forage in open lawn areas, especially after rains that create areas of standing water. This includes the grassy areas in and around the airfield. Up to 10 Hawaiian ducks have been observed foraging along Mokapu Road (MCBH, 2023).

To reduce the hazards of bird strikes, MCBH has a Biological Opinion from USFWS that authorizes non-lethal hazing of ESA-listed species in and around the airfield and air station operational areas (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 (MCBH, 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 death to ESA-listed birds (MCBH, 2023).

Approximately 4.6 acres of vegetation (grass) would be cleared and developed. Site preparation and construction activities would involve the clearing of non-native grasses. Operational activities would include vegetation maintenance. To prevent human-made erosion over time, construction would also include landscape treatment consisting of planting, protective fencing, and walkways. The project design features in Table 2-5 (such as bioretention, vegetated swales, 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 2 would have less than significant impacts to vegetation.

Alternative 2 would include the same lighting standards and daytime construction restrictions to reduce seabird fallout described in Section 3.3.2.2. With the use of these measures, the effects to seabirds from fallout from the Green Field Site alternative would be less than significant and essentially the same as the fallout effects under the Hangar 104 Site alternative.

Considering the temporary nature of the construction impacts, its similarity to ongoing operational noise levels, and the high degree to which wildlife at MCBH have habituated to high levels of noise associated with current activities, Alternative 2 would pose less than significant impacts to Federally listed, State-listed, or Special-status Species

Operations Impacts

Alternative 2 operational impacts would be the same as those under the Alternative 1.

3.3.3 Mitigation Measures

No mitigation measures would be required. The conservation measures described in Table 2-3 would provide reasonable protection measures for natural resources.

3.4 NATURAL HAZARDS AND RESILIENCY

3.4.1 Affected Environment

The Natural Hazards in this area include flooding, seismic activity, hurricanes, and tsunamis. These threats exist in the natural environment with unpredictable frequency and intensity. World War II era facilities around the airfield were constructed prior to flood zone maps and the establishment of the International Building Code, and are susceptible to the natural hazards.

3.4.1.1 Flooding

As directed by Executive Order 11988, federal agencies must evaluate the potential effects of actions occurring in a floodplain to reduce the risk of flood loss; impacts to human health, safety and welfare; and to preserve the natural and beneficial functions served by floodplains. Actions must consider direct and indirect impacts on floodplains. The term "floodplain" generally refers to a defined area that is subject to inundation by a flood. A 100-year flood is an event that, based on historical records and calculated statistical probabilities, has a one in 100 chance (a one percent chance) of occurring in any given year.

Federal Emergency Management Agency (FEMA)-designated flood zones are defined by varying levels of risk and reflect the type and severity of flooding to which an area may be subject. Figure 3.4-1 depicts flood zones designated by FEMA.

The base main cantonment area east of the runway is drained by a series of pipe drain systems primarily to Kailua Bay.

3.4.1.2 Seismic Activity

The entire State of Hawaii is susceptible to seismic activity. Most earthquakes in Hawaii are harmonic tremors associated with volcanic activity. Severe seismic activity can damage or destroy buildings and other structures, including infrastructure, which often results in disruption of service. Figure 3.4-2 depicts the chances of damaging earthquakes across Hawaii (USGS, 2021). The probability of experiencing damaging earthquakes is largely tied to the distance from the island of Hawaii and its volcanic activity.

The International Building Code provides minimum structural design requirements to resist the effects of earthquakes. Structural requirements vary and are based on the predicted potential strength of ground movement in a particular geographic area. The new facilities incorporate these requirements.

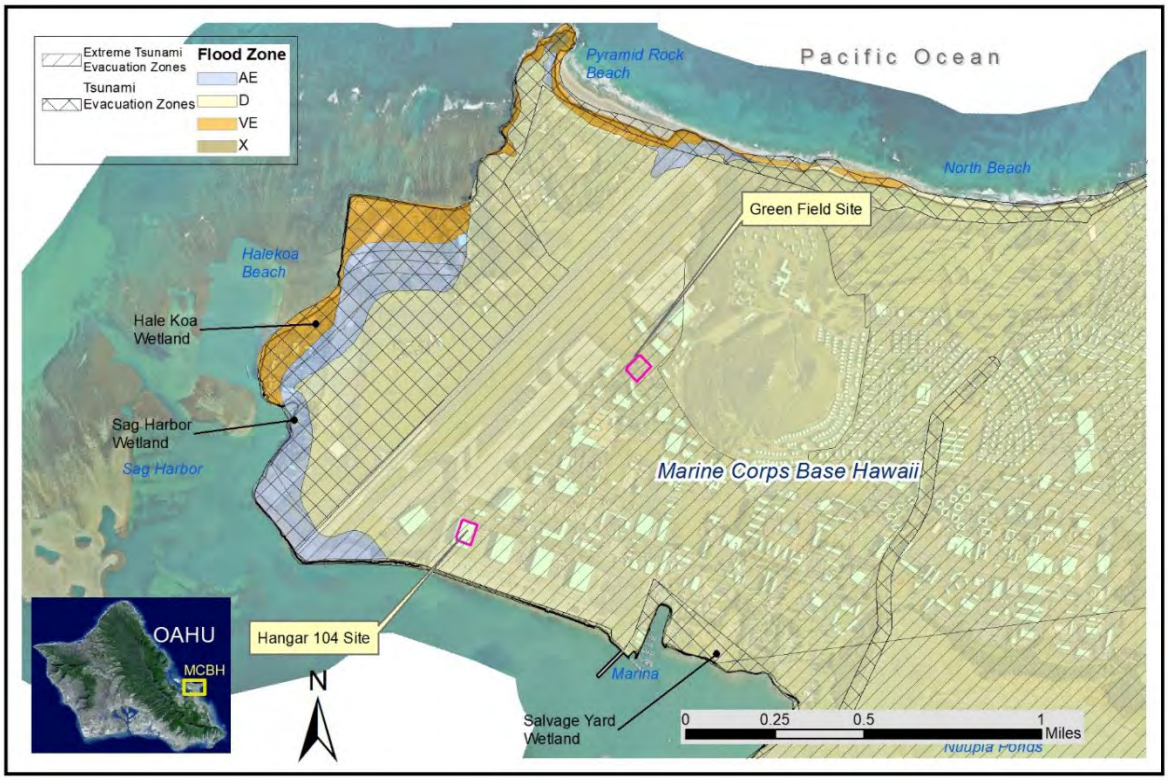


Figure 3.4-1. Flood Zones and Tsunami Potential

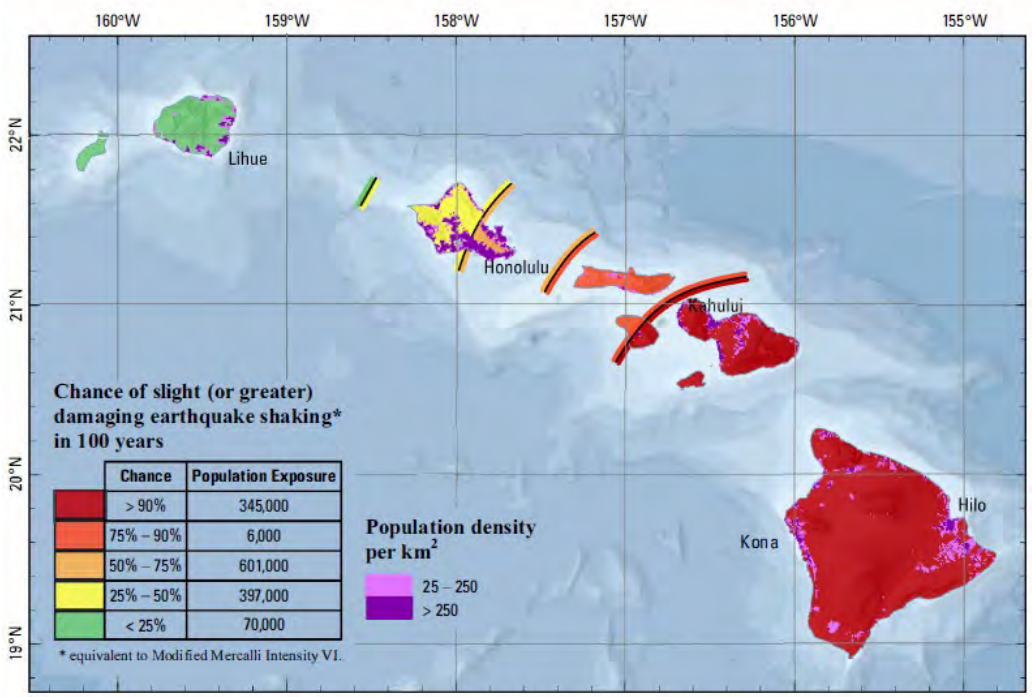


Figure 3.4-2. Chance of Damaging Earthquakes in Hawaii

3.4.1.3 Tsunamis

Although infrequent, a tsunami is capable of causing considerable loss of life and property along coastal areas. Populations, equipment, facilities and materials in and around coastal areas are considered at risk. Tsunami travel times can range from hours for a disturbance off a Pacific Rim coast to a matter of minutes for an earthquake in Hawaiian waters.

Both alternatives are located within the Extreme Tsunami Evacuation Zone (Figure 3.4-1). The peninsula's coastal areas, beaches, and low-lying areas within the installation are subject to storm hazards and hurricanes and could be inundated in the event of a tsunami. MCBH has identified and delineated areas on base that would need to be evacuated in such events. Emergency evacuation shelters have been established for persons living or working in these areas.

The maintenance hangar is classified as a Risk Category III facility to resist structural loads including seismic and wind per UFC 3-301-01 Structural Engineering (WBDG, 2022) Table 2-2 Risk Category of Buildings and Other Structure and UFC 4-211-01 Aircraft Maintenance Hangars.

Risk Category III includes buildings and other structures that represent a substantial hazard to human life or represent significant economic loss in the event of failure. Specifically, this category includes facilities having high-value equipment (including aircraft maintenance hangers). However, the Authority Having Jurisdiction (e.g., owner or building official) may designate these facilities for design tor Tsunami Risk Category I or II.

3.4.1.4 Climate Resiliency

In December 2022, the State of Hawaii issued a Sea Level Rise Vulnerability and Adaptation Report to the Legislature (State of Hawaii, 2022). Their sea level rise exposure mapping in the 2017 Hawaii Sea Level Rise Report was based on an upper-end projection in the 2013 International Panel on Climate Change 5th Assessment Report of 3.2 feet in global mean sea level rise by 2100. However, since 2017, scientific

literature, as well as government and multinational reports, increasingly point to 3 to 4 feet of sea level rise by 2100 as a mid-range, rather than a high-end, scenario for Hawaii.

The state of Hawaii's Geographic Information System (GIS) Program offers information on a 1 percent flood map (e.g., equivalent to a 1 in 100 year flood event) that accounts for a 3.2-foot sea level rise. Per Figure 3.4-3 1, most of the airfield area of MCBH would experience flooding under this type of event. Zone V is defined as a coastal area with a 1 percent or greater chance of flooding with an additional hazard associated with storm waves greater than 3 feet. Zone CA is a coastal zone with waves between 1.5 and 3 feet. Zone A is the boundary where wave height is zero.

The Hangar 104 Site lies within zone CA and the Green Field Site would have some overlap with Zone A. As depicted in Figure 3.4-3, sea level rise is a long-term threat to MCBH airfield operations overall.

Figure 3.4-3. 100-Year Flooding under 3.2-Foot Sea Level Rise with Storm Waves

3.4.2 Environmental Consequences

Project actions are determined to have a significant adverse environmental impact if they increase the potential for exposure, harm, or damage to people or properties from hazards such as earthquakes, floods, or tsunamis. It is important to note that the threat from these hazards always exists because humans have no control over the frequency or intensity of these relatively unpredictable events.

3.4.2.1 No Action Alternative

The No Action Alternative would not have any impact on the severity of natural hazards to which the base is exposed.

3.4.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

The Proposed Action would have no effect on the frequency or severity of the occurrences of the natural hazards to which MCBH may be exposed. However, the Proposed Action could minimally decrease the potential for exposure to these events. New facilities would be constructed following the International Building Code in order to provide minimum structural design requirements to resist the effects of earthquakes.

Coastal regions adjacent to the project area to the west and north are in FEMA flood zones. Per Executive Order 13690, it is the policy of the United States to improve the resilience of federal assets against the impacts of flooding. The Proposed Action would be designed to account for this increased flood risk potential. In addition, the project design features in Table 2-5 would be implemented to manage storm water volumes and minimize any potential flooding or ponding at or near the project area.

The maintenance hangar is classified as a Risk Category III facility to resist structural loads including seismic and wind per UFC 3-301-01 Structural Engineering (WBDG, 2022) and UFC 4-211-01 Aircraft Maintenance Hangars. Recent changes to UFC 3-301-01 Structural Engineering require tsunami design be incorporated into this project based on the facility's location and assigned risk category. The maintenance hangar has been classified by the Authorities Having Jurisdiction (AHJ) as a Tsunami Risk Category II structure where tsunami design is not required. UFC 3-301-01 allows AHJ to reduce Risk Category from tsunami Risk Category III to Risk Category II. The project scope does not currently include costs or design features associated with Tsunami Risk Category III requirements.

3.4.2.3 Alternative 2- Green Field Site

Alternative 2 would move VR-51 aircraft and facilities to a higher elevation that would be less susceptible to damage from storm waves and sea level rise over the long term when compared to Alternative 1. The project would provide some benefits in terms of resiliency. However, in terms of operations, both site alternatives would be equally hampered during times when the airfield is flooded.

3.4.3 Mitigation Measures

No mitigation measures associated with this project would abate the long-term effects of sea-level rise to the MCBH airfield area. Longer-term and larger scope projects, such as sea walls and dunes, may be needed to have any reasonable mitigation for climate change effects, which are outside the scope of this Proposed Action.

3.5 CULTURAL RESOURCES

3.5.1 Affected Environment

Cultural resources are the physical evidence of human activity. Cultural resources that have been determined to be eligible for inclusion in the NRHP are referred to as *historic properties*. If a federal activity (undertaking) would affect a historic property by altering a characteristic of that property that contributes to its eligibility for inclusion in the NRHP, it is considered an adverse effect.

This assessment was conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA) (54 USC 300301 et seq.) and applied the National Register of Historic Places (NRHP) eligibility criteria to make determinations of site eligibility and findings of project effects. The analysis assesses three major categories of cultural resources: archaeology, architecture, and traditional cultural places.

Archaeological sites are discreet locations with material remains of past human life and/or locations where human activity measurably altered the earth. Archaeological resources include but are not limited to pottery, projectile points, pit houses, pictographs, petroglyphs, geoglyphs, tools, weapons, and any portion or piece

of these items. Under the Archaeological Resources Protection Act (ARPA), (16 USC 470aa-470mm) sites/material remains must be a minimum of 100 years of age to be considered archaeological.

Architectural resources make up the built-environment and include buildings, structures, and districts. Bridges and water towers are examples of architectural structures. The NHPA has established a 50-year age minimum for an architectural resource to be considered for eligibility evaluation under the four main criteria for historic properties.

Traditional cultural places (TCPs) are specific locations important to modern-day living communities. They are identified through their association with cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs tend to be rooted in a community's history and are important to the continuing identity of that community.

Districts are groupings of cultural resources linked by temporal or typographic characteristics. Districts may consist of archaeological sites, architecture, or TCPs. Individual resources within the district may not rise to NRHP eligibility status on its own merit, but as part of the surrounding area, may contribute to the overall eligibility of the district. If a resource is a contributing element to an eligible historic district, the resource itself is treated as eligible for the purposes of project planning and execution.

MCBH has conducted cultural resource inventories for the entirety of the undertaking's area of potential effects (APE). The results of these studies are summarized in MCBH's Integrated Cultural Resources Management Plan (Tomonari-Tuggle and Clark, 2021), and Cultural Landscape Report (MCBH, 2018). Hangar 104 is a contributing element of the Naval Air Station Kaneohe Bay Aviation Historic District.

MCBH entered into consultation with Native Hawaiian Organizations with ties to the Mokapu Peninsula. The consulting NHOs did not identify any TCPs within the APE or adjacent (Tomonari-Tuggle, 2014; MCBH, 2018). Because the consulting NHOs did not identify any TCPs or areas of concern within or immediately adjacent to the APE, there would be no effects to TCPs in the area.

The Navy initiated Section 106 consultation with the Hawaii SHPO for the undertaking at Alternative 1 on 21 November 2021 and concluded the proposed undertaking would result in an adverse effect on historic properties. In a letter dated December 27, 2021, the SHPO concurred with the determination of adverse effect and directed the Navy to take into consideration comments received from the public and interested parties regarding the proposed resolution of adverse effects, as part of the Section 106 consultation process. Consultations are expected to conclude with signed Memorandum of Agreement (MOA). The Advisory Council on Historic Preservation (ACHP) elected not to participate.

3.5.1.1 Study Area

The project study area for this analysis incorporates the locations of the Proposed Action alternatives, as well as areas outside the project area potentially affected either directly or indirectly by demolition, construction activities and ground disturbance, or the introduction of new facilities. Historic properties within the study area include the NAS Kaneohe Historic Aviation District (Aviation District), which includes the Naval Air Station (NAS) Kaneohe National Historic Landmark (NHL) District, areas within and adjacent to the Aviation District along the transient ramp, and associated architectural resources along Bravo Ramp. For the preferred alternative (Hangar 104 Site), the Navy defined the Area of Potential Effect within the Section 106 consultation letter as shown in Appendix B of this EA. The Hangar 104 study area also includes potential archaeological resources at Site 5829 north of the hangar along First Street.

3.5.1.2 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.

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 (MCBH, 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 Kuwaaohe Military Reservation in 1918. It was not extensively developed and was deactivated and leased for ranching after World War I (MCBH, 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 World War II. 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 World War II 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 World War II. 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 MCBH on 15 April 1994. This became the headquarters for MCBH, a single command that includes seven other noncontiguous installations in the state (MCBH, 2018).

3.5.1.3 Architectural Resources

The two action alternatives either encompass, or are adjacent to, historic architectural resources that are NRHP listed or eligible (Table 3.5-1, Table 3.5-2). 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 NHL was listed due to its 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 [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 National Register eligible Aviation District. Although not part of the Proposed Action, the historic Hangars 101, 102, 103 and 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 Aviation District is significant for its direct association with the installation's important part in World War II.

Table 3.5-1. Summary of Existing Architectural Resources near Alternative 1

Facility Name/ Number	Year Constructed	Evaluation of Significance	Status
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
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 is planned as part of Home Basing project.
Hangar 104 / Maintenance Hangar 4 Building 104	1941-1942	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 103 / Maintenance Hangar 43 Building 103	1941	Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Designed by the architectural firm of Albert Kahn.	Extant; to be demolished and replaced with a modern hangar prior to 2027 (see cumulative effects section).
Hangar 102 / Maintenance Hangar 2 Building 102	1941	Contributing resource to the Aviation District. Existed at the time of the 7 December 1941 attack. Designed by the architectural firm of Albert Kahn.	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

NAS= Naval Air Station; NHL = National Historic Landmark

Table 3.5-2. Summary of Existing Architectural Resources near Alternative 2

Facility Name/ Number	Year Constructed	Evaluation of Significance	Status
Cold War Non-Commissioned Officer Bachelor Enlisted Quarters, Building 386	1953	Associated with the build-up of the military in support of the Cold War. Building is covered under the 2006 ACHP Program Comment for Cold War Era Unaccompanied Personnel Housing (1946-1974) which fulfilled Section 106 requirements for undertakings affecting these types of buildings, including demolition.	Extant; slated for demolition in support of new Bachelor Enlisted Quarters (P-956/P-973)

NRHP = National Register of Historic Places; ACHP = Advisory Council on Historic Preservation

3.5.1.4 Archaeological Resources

Within the Airfield Area, it was a common practice in the late 1930s—and particularly during the World War II development of NAS Kaneohe—to mine sand from the Mokapu dunes for use as padding under building foundations and as base material in utility trenches. The dunes were a traditional Hawaiian place of interment and the mining extracted sand that contained human remains. As a result, isolated human skeletal remains were inadvertently deposited at building and utility trench locations across the peninsula. These isolated, disturbed remains have been exposed at recent building sites on the installation.

Human skeletal remains, and items associated with the burials are subject to Native American Graves Protection and Repatriation Act (NAGPRA) regulations. Construction projects at MCBH are routinely monitored by archaeologists as a BMP to ensure that any human skeletal remains are identified and treated appropriately.

Table 3.5-3 lists the cultural site potentially affected by the action alternative locations.

Table 3.5-3. Subsurface Cultural Sites Potentially Affected by the Action Alternative Locations

Cultural Site Number	Site Description	Period	NR Significance	NR Status
5829	Subsurface cultural deposit, burials; around Building 6470, north of Hangar 104	TH	Yielded, or may be likely to yield, information important in prehistory or history +++	Recommended eligible for listing on the NRHP +++

Notes: +++ Possible traditional cultural significance; TH=traditional Hawaiian pre-Contact/19th century; M=military 20th century; NRHP = National Register of Historic Places; SHPO = State Historic Preservation Office

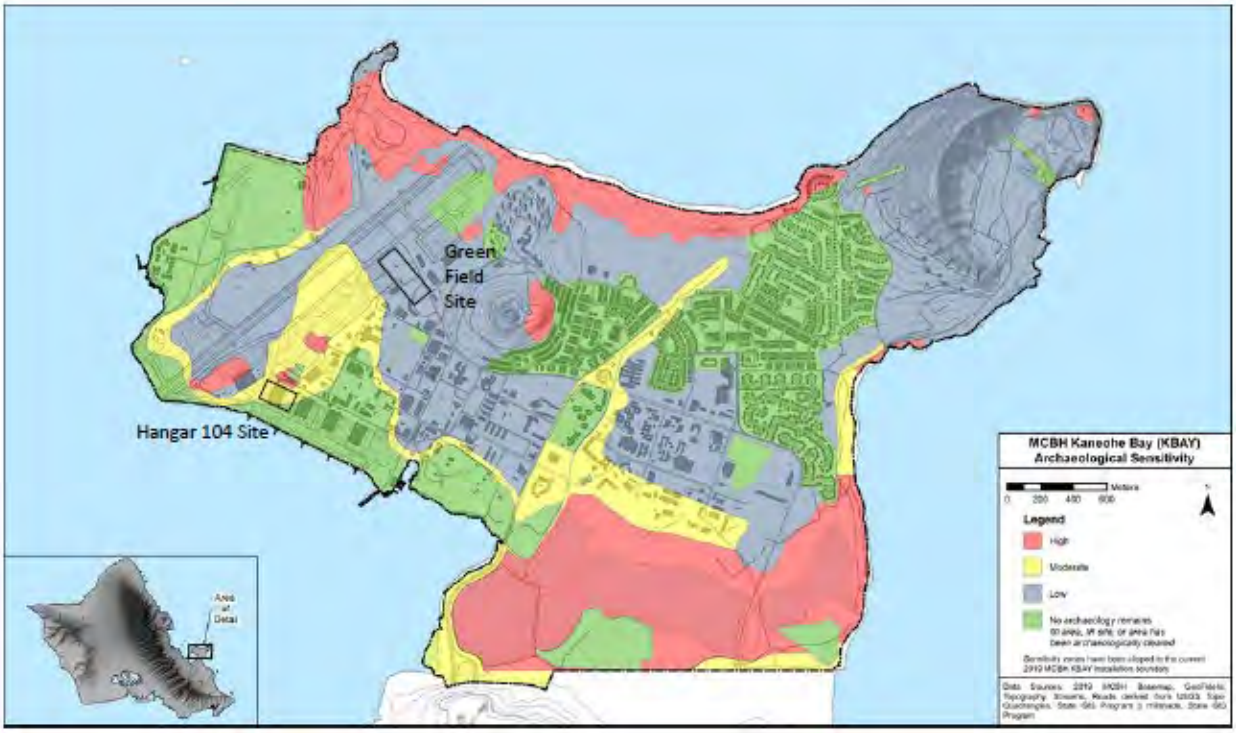


Figure 3.5-1. MCBH Archaeological Sensitivity

Site 5829, adjacent to the Hangar 104 Site, is located in an area of 'high sensitivity' (Figure 3.5-1). During archaeological examination of the area for the construction of a new MV-22 hangar in 2015, a buried cultural deposit was identified containing traditional Hawaiian artifacts, marine shell midden, faunal remains, fire-affected rock, and dense charcoal (Allen, 2015). Follow-on data recovery excavations (Barna et.al., 2017) on the south side of Building 6181 exposed a cultural deposit with two earthen hearths and material including marine shell, fish, pig, and rodent bone, volcanic glass, basalt flakes, and a fire-cracked rock. The deposit was interpreted to represent a "limited set of activities" (food preparation and consumption, tool use and maintenance, and possibly ritual/burial) indicating several short-term camps; isolated human bone was found but no intact burials were observed. These survey finding revised the western and northern boundaries of Site 5829 and added an association with burials (MCBH, 2021). Although Site 5829 extends into First Street, previous archaeological investigations show there is low potential to encounter any cultural deposits within the First Street corridor because it has been heavily disturbed to depths below the cultural layer by an extensive network of subsurface utilities.

The Green Field Site is considered to have low archaeological potential. The nearest archaeological sites, over 600 feet away, would not be disturbed by construction activities.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

The No Action Alternative would not cause any effects on known cultural resources.

3.5.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Construction of a hangar under Alternative 1 would demolish Hangar 104, adversely affecting this historic building**.** The action would adversely affect the NAS Kaneohe Bay Aviation District (Aviation District) by demolishing an eligible historic property and contributing resource to the Aviation District. The demolition of Hangar 104 would also diminish the integrity of the Kaneohe Naval Air Station NHL by altering the setting and characteristic view of the row of five World War II era hangars from key viewpoints through demolition and replacement of the hangar. Hangar 104 was constructed during World War II but after the Japanese attack on December 7, 1941; therefore, its demolition and replacement would not diminish the NHL's exceptional aspect of American history.

MCBH consulted with the SHPO and other interested parties, including the National Trust for Historic Preservation, the Historic Hawaii Foundation, the National Park Service, and NHOs regarding this effect and will enter into a MOA to mitigate the adverse effects. The ACHP declined participation in the consultation. Correspondence with the SHPO and other consulting parties, can be found in Appendix D. The Navy would complete a MOA with the SHPO prior to finalizing a FONSI under NEPA.

The project has potential to adversely affect archaeological resources associated with Site 5829 that may extend into the project footprint. To minimize the risk of inadvertent effects, MCBH will consult with SHPO to prepare and implement a plan for professional archaeological testing, data recovery for any deposits that cannot be avoided, and archaeological monitoring of ground disturbing activities with the potential to affect archaeological resources. The specifics of proposed archaeological monitoring would be implemented as described in the completed MOA.

The demolition of Hangar 104 and construction activities of the new hangar would result in adverse effects on the cultural resources, the Aviation District, Site 5829 and setting of the NAS Kaneohe NHL District. However, measures undertaken in accordance with the completed MOA (see Section 3.5.3 for potential measures) would reduce effects to less than significant levels under NEPA.

3.5.2.3 Alternative 2- Green Field Site

Alternative 2 is adjacent to more modern buildings and hangars along the flight line. The effects of demolition of adjacent Building 386, former BEQ Building, is addressed by the 2006 ACHP Program

Comment for Cold War Era Unaccompanied Personnel Housing (1946-1974) (ACHP, 2006) which fulfilled Section 106 requirements. Building 386 is already slated for demolition. The addition of a new hangar in the setting would have minor adverse effects on the setting of nearby historic properties. If the Navy were to select the Green Field Site, consultation with SHPO and other consulting parties would proceed under the NHPA Section 106 Implementing Regulations.

The nearest subsurface cultural resources are located over 600 feet from potential construction and demolition activities and would likely not be affected. Demolition and construction activities at the Green Field Site would require archaeological monitoring, similar to that for the Hangar 104 Site due to the probable fill sand in the area that could contain secondarily deposited human skeletal remains.

Construction activities associated with a new hangar at the Green Field Site would result in no adverse effects to historic properties (Aviation District). The overall effect to the environment would be less than significant under NEPA. Furthermore, use of BMPs and any mitigation measures developed in a MOA with SHPO (which would be initiated should the site be later identified as a preferred alternative), would reduce these effects.

3.5.3 Measures to Resolve Adverse Effects

MCBH would implement measures to resolve adverse effects to historic properties under the preferred alternative pursuant to a Memorandum of Agreement (MOA) that would be finalized prior to completing a FONSI. Measures to resolve effects on historic properties to be considered in the MOA include, but are not limited to:

- Prepare a Historic Structures Report (HSR) for Building 301, a contributing element to the Aviation District, designed and constructed in 1941 by architects Albert Kahn, Inc. The HSR would be guided by the National Park Service (NPS) Preservation Brief 43: *The Preparation and Use of Historic Structures Reports* and will provide a historic context and detailed building description, existing conditions evaluation, and recommended treatments for future maintenance and use as part of ongoing MCBH facility planning.

- Contract for the development of a 360-degree immersive, interactive mobile application allowing remote interaction with the district and landscape, both inside and outside of Hangar 104. It would provide information relating to Albert Kahn's designs, Hangar 104, the Japanese attack on 7 December 1941, and the John William Flinn Medal of Honor site. The contract would include up to 10 years of data hosting for the application and associated documentation.

- Create a public-facing ESRI Storymap that addresses land use of the Mokapu Peninsula prior to the establishment of Marine Corps Base Hawaii. The Storymap will be created as a compliment to the current mitigation commitment of a WWII-centric Storymap.
- Other measures that may be suggested by SHPO, interested parties, and the public during the public comment period.

MCBH would also consult with SHPO to prepare and implement a plan for professional archaeological testing, data recovery for any deposits that cannot be avoided, and archaeological monitoring of ground disturbing activities with the potential to affect archaeological resources. The specifics of proposed archaeological monitoring measures would be included in the completed MOA.

3.6 INFRASTRUCTURE

3.6.1 Affected Environment

This section discusses infrastructure such as utilities (potable water, wastewater, stormwater, and energy) and facilities and structures such as buildings, roads, and parking areas.

All utility services are available on or near the project sites. The proposed sites would obtain electric service from Hawaiian Electric Company, potable water from the Honolulu Board of Water Supply, and sanitary sewer service from MCBH's water reclamation facility.

There are no potable water wells at MCBH. A system of potable water distribution lines, which are owned and maintained by MCBH, distribute water throughout the base. A potable water main connecting the area west of the airfield to the eastern part of the base runs through Alternative 2, which would likely need to be rerouted to accommodate construction on that site. Alternative 1 currently has infrastructure to supply, store and pump the quantities of fire protection water; such infrastructure does not exist at the Alternative 2.

As discussed in Section 3.2.1.1 and Section 4, the MCBH Kaneohe Bay Water Reclamation Facility receives and treats all wastewater on the base. To address deficiencies, a project was awarded in September 2022 provide redundancy, improve water quality, and provide adequate capacity. This project is expected to be completed in 2028/2029. A pressurized wastewater main line runs in a northwest-southeast direction through Alternative 2 (proposed aircraft mat and hangar locations). Depending on the depth and construction of that line, sections may need to be rerouted around the Green Field Site to accommodate the hangar and airfield mat pavement.

Also discussed in Section 4, MCBH is undertaking two phases of electrical distribution system modernization projects. Phase 1 is underway and will be completed in 2026. Phase 2 will occur between 2026 and 2030. These projects will repair and upgrade various components of the electrical distribution system, including substations, switching stations, and associated electronic controls and sensors. Electrical tie-ins are available at the appropriate configuration at the Hangar 104 Site. Electrical feeders and transformers for the Green Field Site would need to be introduced to support a Hangar on the site. An electric trunk line connecting the area east of the airfield to the western portion of the base runs through the Green Field Site, which would likely need to be rerouted to accommodate construction on that site.

As noted in Section 2.3.2 and Section 2.3.3, each site alternative would displace or remove existing buildings and infrastructure to accommodate construction of a hangar and achieve necessary safety setbacks. Some of the infrastructure that would be displaced/demolished are already slated for demolition under other projects. Other infrastructure that would be displaced would require new Military Construction projects that are subject to future funding cycles that may not correlate with the timing of the Proposed Action; that is, there could be substantial delay to the C-40A project if these required actions are not funded expeditiously.

3.6.2 Environmental Consequences

An impact would be considered significant if the Proposed Action caused demand for electrical, water, wastewater, and solid waste to exceed the capacity of existing and planned systems, including system upgrades. An impact would also be considered significant if the action substantially reduced mission readiness or posed notable adverse health and safety effects due to inferior or unavailable infrastructure.

3.6.2.1 No Action Alternative

The No Action Alternative would perpetuate the lack of available hangar facilities at MCBH for the C-40A. The lack of a facility for aircraft inspection, service, maintenance, and corrosion prevention for these aircraft and the inability to shelter a single aircraft during storm events requires the VR-51 to fly aircraft to other facilities on Hawaii or U.S. mainland. The lack of necessary infrastructure would continue to impede their mission and add unnecessary flight miles to their aircraft. Utility use (water, wastewater, electric) by the VR-51 at MCBH would remain unchanged.

3.6.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

The project would provide essential infrastructure (hangar space) to support the VR-51 mission. Demand for electrical, water, and wastewater is not anticipated to change under the Proposed Action when compared to existing use. Required demolition of additional pavement and structures in and around the site

would not pose any delay to the hangar construction itself. During construction, the VR-51 would use swing space in Hangar 105 for administrative and storage uses.

During operations, infrastructure demand is not anticipated to change under Alternative 1 when compared to existing use. The overall effect would be less than significant.

3.6.2.3 Alternative 2- Green Field Site

The project would provide essential infrastructure (hangar space) to support the VR-51 mission. Demand for electrical, water, and wastewater for VR-51 operations is not anticipated to change under the Proposed Action when compared to existing use, although this alternative would leave Hangar 104 available for reuse which would indirectly increase base water demand, wastewater generation and electricity demand to a minor degree. To construct the hangar and aircraft mat at the site, several mains for electrical, potable water and wastewater that run through the site would need to be removed and rerouted, which would add considerable time and cost to the project, as well as cause intermittent utility outages that may disrupt operations to buildings served by those mains.

The relocation and construction of an access road to the MCAS Air Terminal would need to precede work on the hangar site. To offset the loss of a portion of MCAS Terminal parking and add parking for the new hangar, a new parking garage to the east of the Green Field Site would be needed.

In light of the additional projects to support construction of a hangar on the Green Field Site, construction at this site would likely need to be phased. Under pre-hangar construction phase, relocation of utilities, construction of replacement facilities (for buildings 4000, 6825A, and 5068 described in Section 2.3.3), relocation of the access road for MCAS Air Terminal and new parking for the terminal would need to be completed before the site can be cleared for the new hangar. Based on the duration of completing the pre-construction phase, site preparation for the hangar could take several years to complete when accounting for funding cycles, design work, and construction. These pre-construction projects would also substantially increase the total project cost. Depending on the funding and timing of these extra infrastructure projects to accomplish the Proposed Action, the hangar project itself could be substantially delayed.

The project would include a new mat and ramp to access the runway. Because the project would introduce new impervious surface over approximately eight acres, LID infrastructure for stormwater management would need to be constructed under the new mat.

During construction, the VR-51 would continue to use Hangar 104 for administrative and storage uses. After construction, Hangar 104 would become available for other MCBH aviation uses, such as smaller aircraft storage and maintenance, or shop space.

During operations, infrastructure demand is not anticipated to change under Alternative 2 when compared to existing use. The overall effect would be less than significant.

3.6.2.4 Mitigation Measures

For Alternative 2, several supporting demolition and construction projects would need to be programmed to occur prior to, or in concert with, the construction of the hangar. These would include: LID stormwater management system; early demolition of Building 386; potential relocation of a pressurized wastewater main, electrical main, and potable water main; replacement/relocation of the aircraft rescue halon reclamation building; relocation of a storage building and mechanical building; and replacement of approximately 84 parking spaces for the MCAS Terminal and additional parking for the hangar itself.

3.7 HAZARDOUS MATERIALS AND WASTE

3.7.1.1 Affected Environment

Construction and Demolition (C&D) Waste Management

The PVT Landfill is a privately owned and operated permitted C&D debris landfill located in Waianae. In addition to C&D landfill operations, the PVT Landfill also conducts recycling and materials recovery operations to divert C&D debris from disposal. Recycling and materials recovery operations consist of mining and reclamation of previously landfilled material, as well as operation of an MRF. Recovered materials are sold for recycling and other reuse purposes, reducing the amount of material ultimately disposed of in the landfill (City of Honolulu, 2019).

According to a 2019 brochure from PVT, the facility accepts up to 3,000 tons of C&D waste per day, where approximately 80 percent is reused or recycled using their sorting facility (PVT, 2019). There are additional commercial facilities on Oahu that receive and recycle concrete, asphalt and soil.

Asbestos-containing materials (ACM) may not be disposed of at PVT, but is accepted at the Waimanalo Gulch Landfill on Oahu.

Handling and disposal of hazardous materials at MCBH are regulated by policies set forth by the EPA and the State of Hawaii DOH.

Installation Restoration (IR) Sites

MCBH conducts an Installation Restoration (IR) program that manages sites where remediation or other efforts are being undertaken due to the release of hazardous materials or petroleum products.

Neither site alternative overlaps any known contaminated groundwater sites. Given the uses of the sites for aviation operations for several decades, it is possible soil or groundwater contamination could be encountered during demolition or construction activities.

VR-51 Hazardous Materials

VR-51 aircraft maintenance activities typically generate small quantities of hazardous wastes, including oil, filters, brake fluid, hydraulic oil, rags, solvents, and greases. They store their hazardous materials in fire-proof storage lockers or containers.

As discussed in Section 3.2.2.2, Hangar 104 uses a water only system for fire suppression. There is no AFFF storage at the site.

3.7.2 Environmental Consequences

A project action is determined to have a significant adverse environmental impact if it results in the release of hazardous or toxic materials, particularly if it increases the potential for human exposure.

3.7.2.1 No Action Alternative

The No Action Alternative would not increase the risk of release of hazardous materials or waste, increase the risk to base personnel of exposure to hazardous waste, nor affect IR sites near project areas.

3.7.2.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Under this alternative, Hangar 104 would be demolished. Based on the age of Hangar 104, lead, cadmium, chromium, mercury, polychlorinated biphenyl (PCB)-containing light ballasts, and mercury-containing switches and lamp may be present.

The Historic American Building Survey (HABS) record for this building (HI-311-A) states that corrugated asbestos panels and asbestos coated steel panels were typical in these hangar designs. Throughout the years, ACM transite wall panels have been removed and replaced with standard corrugated wall panels, but it is unknown if all wall panels have been remediated. Typically, interior renovations have been made in front of old structures, making potential ACM not accessible for testing (Kajioka, 2023).

In accordance with HAR 11-501 Asbestos Requirements, DOH would be notified of any demolition or renovation work involving asbestos, if required. BMPs would be employed during demolition or renovation work to prevent and/or minimize the release of hazardous materials and to protect workers. This would minimize the risk of persons on base being exposed to health hazards associated with these hazardous materials.

Proper removal, handling, transport and disposal of hazardous materials from the premises of buildings that contain lead-based paint and asbestos-containing material (ACM) would be conducted by qualified professionals, in compliance with all applicable state and federal health, safety, and environmental regulations.

Hangar 104's fire protection system currently uses water. There would be no firefighting foam in the system that would need disposal.

Demolition of Hangar 104 is estimated to generate approximately 9500 tons of waste, which would consist primarily of concrete and steel. This demolition waste would be disposed of at the PVT Landfill that routinely source separate materials and recycles construction materials.

No significant short-term or long-term adverse impacts related to materials and waste are expected to occur.

3.7.2.3 Alternative 2- Green Field Site

During the pre-construction phase, three structures (Buildings 4000, 6825A, and 5068) totaling 5,200 square feet would be demolished and replaced elsewhere on the base. These demolitions would generate approximately 410 tons of waste. Additionally, asphalt from a portion of the MCAS Air Terminal parking lot would be removed and require asphalt recycling. While demolition of other buildings and structures surrounding the proposed hangar would be required to provide adequate setbacks and parking, the largest demolition (Building 386) would have occurred anyway in support of BEQ consolidation at MCBH. Based on the age of Building 386, lead paint and ACM are likely present. Proper removal, handling, transport and disposal of hazardous materials would be conducted by qualified professionals, in compliance with all applicable state and federal health, safety, and environmental regulations.

Constructing a Type III hangar at the Green Field Site would produce much less demolition waste when compared to the Hangar 104 Site. No significant adverse impacts related to materials and waste are expected to occur.

3.7.3 Mitigation Measures

No mitigation measures would be required.

3.8 NOISE

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment. Noise in relation to biological resources and wildlife species is discussed in the Biological Resources section.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual. While aircraft are not the only sources of noise in an urban or suburban environment, they are readily identified by their noise output and are given special attention in this EA.

3.8.1 Basics of Sound and Noise Metrics

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because of this vast range, it is unwieldy to use a linear scale to represent the intensity of sound. As a result, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound, also referred to as the sound level. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 and 140 dB are felt as pain (Berglund and Lindvall, 1995).

All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second, or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale, which places less weight on very low and very high frequencies in order to replicate human hearing sensitivity. The general range of human hearing is from 20 to 20,000 cycles per second, or Hz; humans hear best in the range of 1,000 to 4,000 Hz. A-weighting is a frequency-dependent adjustment of sound level used to approximate the natural range and sensitivity of the human auditory system.

Table 3-5 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale. Figure 3-2 (Cowan, 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time.

Table 3-5 Subjective Responses to Changes in A-Weighted Decibels

Change	***Change in Perceived Loudness***
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Aircraft noise varies with time. During an overflight, noise starts at the background level, rises to a maximum level as the aircraft flies above the receiver, then returns to the background level as the aircraft

recedes into the distance. A number of metrics can be used to describe aircraft operations—from a particular individual aircraft event to the cumulative noise effect of all aircraft events over time.

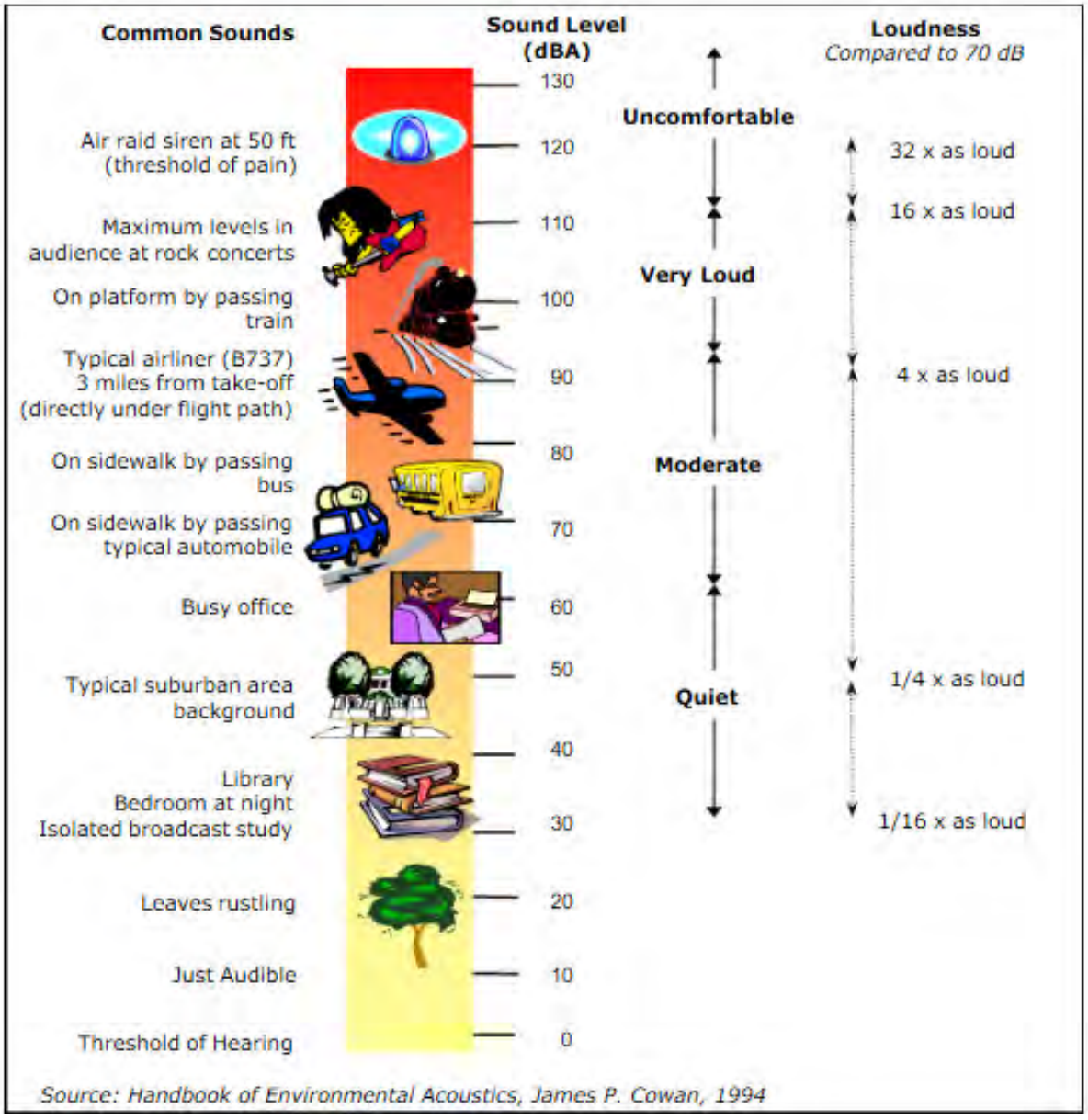


Figure 3.8-1 A-Weighted Sound Levels from Typical Sources

The primary noise metric utilized in this document for noise impacts is the Day-Night Average Sound Level (Ldn, also written as DNL), which is A-weighted applicable for subsonic aircraft operations. DNL is a cumulative metric that includes all noise events occurring in a 24-hour period with a nighttime noise weighting applied to events occurring after 10 p.m. (2200) and before 7 a.m. (0700). The daytime period is defined as 7 a.m. (0700) to 10 p.m. (2200). An adjustment (weighting) of 10 dB is added to events occurring during the nighttime period to account for the added intrusiveness while people are most likely to be relaxing at home or sleeping. Note that “daytime” and “nighttime” in calculation of DNL are sometimes referred to as “acoustic day” and “acoustic night” and always correspond to the times given above. This is often different than the “day” and “night” used commonly in military aviation, which are directly related to the times of sunrise and sunset applicable for military training in dark conditions. These

times vary latitudinally, and throughout the year with the seasonal changes.

While a cumulative metric, such as DNL is appropriate to predict the overall noise environment at airfields, additional description of noise impacts to noise sensitive locations requires additional metrics. DoD expands upon DNL with the supplemental metric Sound Exposure Level (SEL) as described in the DNWG guidelines (DNWG 2009). The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or Lmax, which occurs over one-eighth of a second and denoted as “fast” response on a sound level meter (American National Standards Institute [ANSI] 1988). Although useful in determining when a noise event may interfere with conversation, TV or radio listening, or other common activities, Lmax does not fully describe the noise because it does not account for how long the sound is heard.

SEL combines both the intensity of a sound and its duration by providing the sound level that would contain the same sound energy of an event if occurring over a 1 second period. This means that SEL does not represent a sound level that is heard directly at any given time. However, SEL provides a better metric for comparison of aircraft flyovers than Lmax because it allows normalization of disparate events to their 1 second energy average, which is presented in this analysis for comparison between the alternatives. SEL values are larger than those for Lmax for the same event because aircraft noise events last more than a few seconds.

3.8.2 Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 A-weighted decibels (dBA) over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hourperiod. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The joint instruction, Chief of Naval Operations Instruction (OPNAVINST) 11010.36C and Marine Corps Order 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. OPNAVINST 3550.1A and Marine Corps Order 3550.11 provide guidance for a similar program, RAICUZ. This program includes range safety and noise analyses, and provides land use recommendations which will be compatible with Range Compatibility Zones and noise levels associated with military range operations.

DoD Noise Program Policy (DoD Instruction 4715.13, 28 January 2020) requires the use of the DNL noise metric to describe aircraft noise exposure levels at airfields based on average annual day (AAD) averaged over 365 days for purpose of long-term compatible land use planning. Consistent with that standard, this document analyzed both military and civil operations at the airfield on an average annual basis.

The DoD prescribes use of the Noisemap suite of computer programs (Wyle 1998; Wasmer Consulting 2006) containing the core computational programs called “NMAP,” version 7.3. For this document, the Noisemap suite of programs refers to BASEOPS as the input module, Noisemap as the noise model for predicting noise exposure in the airfield environment from fixed-wing aircraft operations. Advanced Acoustic Model (AAM) was the noise model used for predicting noise exposure in the airfield environment 12 from rotary- and tilt-wing aircraft operations. Noise grid results from both noise models were combined to 13 develop a complete airfield noise exposure footprint (Appendix F).

3.8.3 Affected Environment

The predominant noise sources in the project area and region of influence are the aircraft using MCBH 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.

MCBH is comprised of one runway, Runway 04/22 oriented in a northeast and southwest direction. All fixed-wing aircraft operations occur along Runway 04/22 which is 7,771 feet in length and 150 feet in width. Tilt-rotor and rotary-wing aircraft were modeled to arrive at runway ends and depart from both the runway ends and runway midfield; additionally, these aircraft completed closed patterns along Runway 04/22, Westfield Training Area, and Combat Area Loading Area (CALA). There are also rotary-wing operations to/from pad 101 and the fuel pits.

MCBH is home to four USMC and two Navy aviation assets. USMC aviation units include the following: Marine Air Refueler and Transport Squadron (VMGR) 153 operating C-130J aircraft; Marine Unmanned Aerial Vehicle Squadron (VMU) 3 operating MQ-9 aircraft; and, Marine Medium Tiltrotor Squadron (VMM) 268 and 363 operating MV-22B aircraft. Navy aviation units include the Navy Headquarters Squadron operating C-20G aircraft; Helicopter Maritime Strike Squadron (HSM) 37 operating MH-60R aircraft and Patrol Squadron (VP) 4 operating P-8A aircraft. With 260 weekdays per year and after accounting for holidays and weather, results in the following annual sorties (Navy 2022):

- C-130J, 660 sorties
- C-20G, 853 sorties
- MH-60R, 1,788 sorties
- MQ-9, 1,500 sorties
- MV-22B, 4,820 sorties
- P-8A, 142 sorties

Each sortie generates one departure, one arrival, and closed pattern events count as two tower operations.

Transient military aircraft operations total 6,668 per year based upon most recent agency input and air traffic control tower counts (Navy 2022).

DNL noise contours range from 65 to 85 dB in 5-dB increments for the existing conditions at MCBH. Noise generated from aircraft operations occurs both within and outside the airfield. Portions of the 65 dB DNL contour extends east and west of the base boundary by approximately 1.5 and 2.0 miles, respectively. Approximately 1,887 acres exists beyond the base boundary at the noise level of 65 DNL and above. No residential areas, schools, or hospitals are currently exposed to 65 dB DNL or greater, which is the DoD threshold for land use recommendations for noise sensitive land uses. SEL values at each of the POIs range from 72 to 110 dB SEL for sensitive receptors. The values presented are predominately based on transient military fighter aircraft departures and occur infrequently. A Noise Study was conducted in 2024/2025 in support of this EA to assess impacts of C-40A operations. See Appendix F.

3.8.4 Environmental Consequences

3.8.4.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline noise levels. Therefore, no significant impacts due to the noise environment would occur with implementation of the No Action Alternative.

3.8.4.2 Alternative 1- Hangar 104 Site (Preferred Alternative)

Construction Impacts

Construction noise would generally be lower than existing aircraft noise levels in the airfield area. Under the Preferred Alternative, construction noise would occur primarily during day-light hours. At 500 feet from the construction source, noise would decrease to approximately 54 dB resulting in noise levels that would be indistinguishable within the acoustic environment of the airfield (MCBH, 2022A). Construction noise would not be perceptible to on-base or off-base residents or sensitive receptors.

Operational Impacts

Annual flight operations, maintenance and static operations, closed pattern altitudes, and flight tracks not associated with C-20G aircraft would remain as described under existing conditions. The following would change under Alternative 1:

- C-20G flight, maintenance and static operations would be reduced by 50% to accommodate the reduction in C-20G aircraft from 2 to 1.
- C-40A flight, maintenance and static operations would be introduced and operate along the same flight tracks as C-20G aircraft.
- C-40A aircraft would complete 113 sorties annually

DNL noise contours from 65 to 85 dB in 5-dB increments would occur under Alternative 1. As with the Existing Conditions, noise generated by aircraft operations at MCBH would occur both within and outside of the airfield. Similar to the Existing Conditions, the 65 dB DNL contour extends east and west of the base boundary by approximately 1.5 and 2.0 miles, respectively. Implementation of Alternative 1 would result in a reduction of 8 acres beyond the base boundary at the noise level of 65 DNL and above. There would not be any increase in DNL values at representative POIs under Alternative 1. Maximum SELs under the Alternative 1 would be identical to SELs under the Existing Conditions at respective POIs. Transient military fighter aircraft departures would continue to be the primary contributor and occur infrequently. See Appendix F.

3.8.4.3 Alternative 2- Green Field Site

Construction Impacts

Construction impacts for this alternative would be the same as those described in Alternative 1.

Operational Impacts

Operational impacts for this alternative would be the same as those described in Alternative 1.

3.8.5 Mitigation Measures

Noise BMPs would be implemented as practical to reduce noise in sensitive receptors. Since the Proposed Actions would not result in significant noise impacts from C-40 operations, no other mitigation measures for noise would be necessary.

4 CUMULATIVE IMPACTS

Cumulative impacts are the result of two or more individual effects that, when considered together, compound or increase the overall impact. Cumulative impacts can arise from the individual effects of a single action or from the combined effects of past, present and/or future actions. Therefore, cumulative impacts can result from individually minor actions that collectively amount to significant actions over time.

Capital improvement projects proposed during the Proposed Action implementation timeframe, projects related to the change in base population over time, and projects affecting utility capacity or those overlapping or in close proximity to the action alternatives were reviewed during the analysis of cumulative impacts (Table 4-1).

Table 4-1. Past, Present, and Future Actions or Trends Relevant to Cumulative Effects

Title	Description	Implementation Timeframe
P-2001 VR-51 C-40A Maintenance Hangar (Proposed Action)	Construct a Type III C-40A aircraft maintenance hangar at the Hangar 104 Site or Greenfield Site on MCBH.	2025-2028
Deactivation helicopter squadrons and divestment of RQ-21 aircraft at MCBH	AH-1/UH-1 squadron (27 aircraft) and the CH-53E squadron (15 aircraft) were deactivated, and the RQ-21 aircraft were divested. Resulted in a reduction of 841 personnel plus dependents from MCBH.	Complete in 2022
Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron	The action stationed approximately 229 MQ-9 and 447 KC-130J military personnel, for a total of approximately 676 personnel plus dependents at MCBH. Six (6) MQ-9s and fifteen (15) KC-130Js will be based at MCBH. Hangar 6886 will house the KC-130J squadron displacing MV-22s. Hangar 103 will be demolished (with support buildings 159, 160, 161, 183, and 184) and a modern Type II hangar will house the MV-22 squadron. Hangar 102 will be used for MQ-9. ..	2023-2028
P-935 Phase 1 Electrical Distribution Modernization, Base-wide	Repair and upgrade various components of the electrical distribution system, including substations, switching stations, and addition of SCADA System. Renovates primary substations 5033, 820, 5092 (13,681 square feet).	2022-2028
P-968 Phase 2 Electric Distribution Modernization	Repair and upgrade of various components of the electrical distribution system. Demolition of building 1274 . Renovates primary Substation 1125	2026-2030
P-875 Wastewater Treatment Plant Redundancy and Modernization	Upgrades 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.	2025-2028/2029
P-1007 Maintenance Facility	New consolidated maintenance facility and warehouse storage and replacement van pads. Demolition of Van Pads C and D.	2040+
P-843 Multi-purpose Training Complex	Facility to support training using simulators housed in temporary or semi-permanent facilities. Includes rappel tower and gas chamber. Demolishes Building 6076, temporary facilities 6757C3, 6758C3, 6756C3, 6755C3, 6708C3, 6710C3, 6781C3, 6771C3, Rappel Tower 6042, Gas Chamber 6006, and Leadership Reaction Course 6075.	2030+
P-913 MAG-24 Armory Expansion	Expands Building 4054 (Armory). Demolishes three existing modular armories and one concrete armory (11,905 square feet)	2040+
P-956 Bachelor Enlisted Quarters	180-person quarters. Demolishes Buildings 1655 and 1656 (48,470 square feet) and together with P-973 construct new a BEQ consisting of 190 units for 380 personnel and other new support facilities.	2022-2026

Title	Description	Implementation Timeframe
P-973 Bachelor Enlisted Quarters	200-person quarters. Demolition: Building 386 (next to Green Field Site), 1634, and 1635 (47,620 square feet) and together with P-956 construct new a BEQ consisting of 190 units for 380 personnel and other new support facilities.	2024-2028
P-912 Bachelor Enlisted Quarters	200-person quarters to support new Aviation Squadrons and MWSS. Demolishes Buildings 1633 and 1654 .	2034+
Parking Structure (MILCON P-876)	Approximately 620 spaces between Hangars 101 and 104 must be eliminated due to airfield safety reasons. Constructs parking structures at two locations on the north side of First Street across from Hangars 101 and 103.	2034+
3rd Marine Littoral Regiment (MLR) at MCBH.	Constructs required supporting facilities with associated training; Constructs MLR Operations complex; demolishes Buildings 1284 and 6765CE; P994 Constructs 3rd Littoral Combat Team Complex; new vehicle maintenance facility, , shops, warehouses and headquarters;P994 Constructs MLR Regimental Headquarters; B3089 HI2401M Constructs 111-person Bachelor Enlisted Quarters for MLR, demolishes Buildings – P957; and P-1001 – 3DMLR Motor-T Renovation/Modernization Renovates blg 3014 and demos Blg 3018	FY2023 2033+ FY2033+ FY2025 FY2040+ 2040+

4.1 Cumulative Effects Analysis

4.1.1 Air Quality

Construction emissions associated with projects at MCBH would result in temporary air emissions in the region of influence. Many current and future projects may overlap temporally and geographically with the construction period of the Proposed Action. Pollutant releases from construction equipment and material transport would include criteria pollutants. The Home Basing initiative includes a wide range of projects planned between 2023 and 2027. However, assuming the basing and other construction projects triple the amount of air pollution when compared to the C-40A hangar project in any given year, the annual levels of criterial pollutants would still fall below de minimis levels. As future projects consist principally of updated infrastructure with little new air emissions, operational air pollutant emissions from buildings 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.

The C-40A hangar would generate construction emissions between 274 and 468 tons of CO_2 over a three year period (not accounting for embodied carbon of construction materials). The Home Basing construction period would generate approximately 1,065 tons of CO_2 over a 5 year period. For years where both projects are occurring, emissions would be approximately 350 tons/year. These levels would not be regionally significant.

Home basing changes in aviation operations would increase annual CO_2 emissions by approximately 4,700 tons/year. The net annual change to MCBH Hawaii emissions from aircraft operations may be much lower than this because the calculation did not take into account reductions associated with the deactivation of the AH-1/UH-1 and CH-53E helicopter squadrons. While the emission profiles of the different aircraft vary, the basing changes between 2022 and 2030 (actions described in Table 4-1) would likely cause the levels of annual criteria pollutants and carbon intensity from aviation operations at MCBH to remain the same or only slightly higher.

4.1.2 Water Resources

Projects would incorporate LID features that will reduce the overall amount of storm water and associated pollutants (e.g., sediment) from discharging to marine waters (i.e., Kaneohe Bay). The projects will comply with all existing MCBH NPDES permits, plans, and orders regarding water quality resources.

4.1.3 Biological Resources

The Proposed Action and other construction projects planned at MCBH would introduce noise, heavy equipment movement, air emissions and truck traffic that could displace or disturb biological resources. Planned construction would occur predominantly at previously developed and actively used areas that are not deemed important habitats for special-status species. Conservation measures would be applied to projects to avoid or minimize potential effects to wildlife (including ESA-listed species) during the construction. For operations, considering the projects are largely upgrades to or replacement of existing infrastructure, the nature of the projects would not introduce new noise sources, nor significantly change the amount of impervious surfaces. Therefore, implementation of the Proposed Action would not result in significant cumulative impacts to biological resources in the region of influence.

4.1.4 Natural Hazards and Resiliency

MCBH faces the threat of several natural hazards and its relatively low elevation makes it susceptible to the threat of sea-level rise from climate change. While none of the projects planned, including the Proposed Action, can fully abate these risks, the replacement of aging infrastructure with new buildings that meet modern structural standards and incorporate seismic design considerations creates a beneficial cumulative effect with regard to personnel safety.

4.1.5 Cultural Resources

The NAS Kaneohe Aviation District has been impacted over time with the demolition of 15 of the total 57 historic buildings, structures, and objects since nomination of the district in 2006. The Home Basing action (2023-2027) will demolish and replace Hangar 103 and five other support buildings (159, 160, 161, 183, and 184). Cumulatively, with the Proposed Action, a total of 22 historic buildings, structures and objects would be demolished since nomination of the district. The Marine Corps has entered into a MOA under the NHPA to resolve adverse effects resulting from the Home Basing action. Among other mitigations under the MOA, MCBH will initiate a Historic Context Study and Intensive Level Survey Report with Design Standards (HCS/ILS Report) for the Kaneohe NAS NHL and NRE Aviation Historic District. The HCS/ILS Report will reevaluate all historic resources that may be included within the Kaneohe NAS NHL update and NRE Aviation Historic District to better understand their significance and relationships. Once the Historic Context Study and Intensive Level Survey portion of the report has been completed, MCBH will develop Design Standards to inform: (1) the preservation of existing historic properties; (2) the addition of new and/or nonconforming structures and buildings and structures within and adjacent to the Kaneohe NAS NHL to avoid, limit, or mitigate adverse effects. MCBH will also update Kaneohe Naval Air Station National Historic Landmark Registration Form.

Under the Proposed Action (preferred alternative at the Hangar 104 Site), the Navy would demolish and replace Hangar 104, which would cumulatively further reduce the integrity of ‘hangar row’ along the Bravo Ramp and affect the visual setting for the NHL District. The Navy would also enter into a MOA for the preferred alternative for a C-40A hangar at Hangar 104. Past, present, and future projects have and would adversely impact both the Kaneohe NAS NHL and the Aviation Historic District; however, implementation of measures to resolve adverse effects in accordance with respective project MOAs, the impacts would not be significant enough to remove the listing/eligibility of the Aviation Historic District or the Kaneohe NAS NHL. For this reason, cumulative impacts to cultural resources would be less than significant.

4.1.6 Infrastructure

MCBH has been modernizing its infrastructure in recent years. The flight line has many newer buildings as a result of changes in aircraft operations. Plans for new aviation facilities, barracks, parking structures, and improvements to utilities will continue for the next several years. Particularly, upcoming actions such as Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron and 3rd Marine Littoral Regiment (MLR) will demolish existing buildings, construct new buildings and reconfigure utility feeders to serve these buildings.

The Proposed Action of constructing a C-40A hangar would be a minor change in the context of all the other infrastructure projects occurring. Overall, the home basing actions (past and future) will decrease base population, while the 3rd Marine Littoral Regiment and potential VR-51 Squadron expansion would increase population. On balance, when compared to 2022 levels, overall base population would remain generally the same, meaning that existing utility, road, and other common infrastructure should be sufficiently sized to accommodate these actions. Therefore, the Proposed Action would result in less than significant cumulative effects on infrastructure.

4.1.7 Hazardous Materials and Waste

Combined, future demolition and construction projects across MCBH would increase the demand for construction materials (steel, concrete, asphalt, etc.) on Oahu. A few projects would occur within the same timeframe, possibly causing adverse effects in light of recent inflation and global supply chain issues in the construction market. Most construction materials (finished goods or raw materials) are imported from the mainland, which may induce additional ship traffic to Oahu, but overall, the effects would be minimal when compared to overall shipment of goods to and from the island. Demolition debris would be transferred to the PVT Landfill, which currently recycles approximately 80 percent of received waste. By recycling these materials, the need for off-island resources is reduced, which in turn reduces the carbon footprint of these materials. To the degree these projects can specify lower-embodied carbon materials (such as steel from recycled sources), the overall effect to CO_2 can be reduced. Overall, the Proposed Action would result in less than significant cumulative effects on materials and waste.

4.1.8 Traffic

Cumulative impacts to transportation for construction projects that may overlap may contribute to 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. Most of the future projects are upgrades to the existing infrastructure and are therefore not anticipated to significantly increase base personnel.

For context, the Home Basing action would increase average daily traffic volume on H-3 less than one (1) percent. Of the actions shown in Table 4-1, at any given time, approximately ten projects would be underway during construction of the Proposed Action. As such, assuming the construction impacts are similar among projects, at a ten (10) percent high-case scenario, the increase would not result in a significant cumulative impact. With regard to non-construction commuter traffic, in the overall number of personnel across all the future actions in Table 4-1 would remain near steady from 2022 levels. Consequently, the Proposed Action would not contribute to significant cumulative impacts to traffic outside the installation.

4.1.9 Noise

Construction noise associated with projects at MCBH would result in temporary increased noise in the region of influence. Many current and future projects may overlap temporally and geographically with the construction period of the Proposed Action. The Home Basing initiative includes a wide range of projects planned between 2023 and 2027 that would involve potential construction noise. Noise BMPs would be implemented as practical to reduce noise to sensitive receptors. The predominant noise sources in the project area and region of influence are the aircraft using MCBH 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. However, thus the Proposed Action would not result in significant cumulative noise impacts within the region of influence.

5 SUMMARY AND CONCLUSIONS ON THE IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

Based on the analysis of environmental impacts of the Proposed Action and the No Action Alternative, this EA concludes that no significant adverse environmental impacts are expected as a result of implementing the Proposed Action. Table 5-1 summarizes the potential impacts that could result from the alternatives evaluated.

Table 5-1. Comparison of Alternatives.

Environmental Resource	Alternative 1- Hangar 104 Site (Preferred Alternative)	Alternative 2- Green Field Site	No Action Alternative
Air Quality	Short-term, temporary emissions of criteria pollutants during demolition and construction below de minimis levels. Construction-related CO_2 would be temporary. Operations would not significantly increase air emissions or impact local air quality standards.	Short-term, temporary emissions of criteria pollutants during demolition and construction below de minimis levels. Construction-related CO_2 would be temporary. Operations would not significantly increase air emissions or impact local air quality standards.	No impact
Water Resources	With the use of BMPs described in Table 2-2, construction storm water runoff would be limited and protective of water resources.	With the use of BMPs described in Table 2-2, construction storm water runoff would be limited and protective of water resources.	No impact
Biological Resources	Short-term, temporary noise and disturbance to species during demolition and construction. Action would occur in a high noise zone where species are acclimated to noise, resulting in less than significant impacts. The project would occur in a built-up area that does not provide significant habitat to listed species.	Short-term, temporary noise and disturbance to species during demolition and construction. Action would occur in a high noise zone where species are acclimated to noise, resulting in less than significant impacts. The project would occur in a built-up area that does not provide significant habitat to listed species.	No impact
Natural Hazards and Resiliency	Project would be located in FEMA Zone D, an area where flood hazards are possible, but not within a 100-year floodplain. With sea level rise, this site would be subject to increased flooding events over time.	Project would be located in FEMA Zone D, an area where flood hazards are possible, but not within a 100-year floodplain. With sea level rise, this site would be subject to increased flooding events over time. However, this site is a slightly higher elevation than the Hangar 104 Site, reducing flooding potential somewhat.	No impact
Cultural Resources	The Project would demolish Hangar 104, adversely affecting this historic building. This alternative would adversely affect the Naval Air Station Kaneohe Bay Aviation District by demolishing an eligible historic property and contributor to the Aviation District, and altering the setting of the Aviation District with the construction of a new, taller hangar. However, measures undertaken in accordance with the completed MOA would reduce effects under NEPA to less than significant levels. The project has potential to adversely affect archaeological resources at Site 5829. Measures to resolve effects described in the completed MOA	The addition of a new hangar would result in no adverse effects to historic properties. The nearest subsurface cultural resources are 20th century concrete and metal structural remnants that have been recommended by MCBH as not eligible for listing on the NRHP. Overall, construction of a Type III hangar on the Green Field Site would have less than significant effects on cultural resources.	No impact

Environmental Resource	Alternative 1- Hangar 104 Site (Preferred Alternative)	Alternative 2- Green Field Site	No Action Alternative
	under Section 106 would reduce anticipated impacts.		
Infrastructure	Project would provide essential infrastructure to support the VR-51 mission. Demand for electrical, water, and wastewater is not anticipated to change. Pavement and structures in and around the site would be demolished. Impacts to infrastructure would be negligible.	Project would provide essential infrastructure to support the VR-51 mission. A new mat and ramp to access the runway would be required. Also a several utility mains (electric, wastewater and potable water) would need to be replaced, which would add substantial time and cost to the project, as well as disrupt operations temporarily to buildings served by that main. The demolition and necessary replacement of parking areas and support buildings would also add to the time and cost of the project above that required of the Hangar 104 Site. During construction, the VR-51 would continue to use Hangar 104 for administrative and storage uses. After construction, Hangar 104 would become available for other MCBH aviation uses, such as smaller aircraft storage and maintenance, or shop space.	The VR-51 Squadron would remain without a permanent local hangar for inspections, maintenance and aircraft shelter.
Hazardous Materials & Waste	Demolition of Hangar 104 would require abatement and disposal of lead-based paint and ACM. With appropriate health and safety procedures, effects would be less than significant. Demolition would generate waste, although most of the concrete and steel could be recycled. No significant short-term or long-term adverse impacts related to materials and waste are expected to occur.	Demolition of surrounding buildings at the Green Field site would also generate ACM and lead-based paint waste. With appropriate health and safety procedures, effects would be less than significant. Demolition would generate waste, although most of the concrete and steel could be recycled. No significant short-term or long-term adverse impacts related to materials and waste are expected to occur.	No impact.
Noise	Less than significant effects to noise.	Less than significant effects to noise.	No impact.

5.1 CONSISTENCY WITH FEDERAL POLICIES AND EXECUTIVE ORDERS

The Proposed Action is consistent with various federal policies and Executive Orders, including but not limited to: the National Environmental Policy Act; National Historic Preservation Act; Clean Water Act; Clean Air Act; Endangered Species Act; Migratory Bird Treaty Act; Sikes Act; EO 11988 – Floodplain Management EO 11990 – Protection of Wetlands; EO 13045 – Environmental Health Risks and Safety Risks to Children; EO 13186 – Protection of Migratory Birds, and EO 14057 - Federal Sustainability Plan.

5.1.1 FEDERAL POLICIES

5.1.1.1 The National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 CFR 800), require federal agencies, while reviewing and evaluating their programs, to identify and consider the potential effects of their Proposed Actions on historic properties. Before approval of an undertaking, agencies are required to consult under Section 106.

The Proposed Action includes demolition of historic buildings at the preferred alternative site. Construction at the Hangar 104 Site may also affect archaeological resources. MCBH and the Navy initiated consultation

under Section 106 and will enter into a MOA to mitigate or avoid adverse impacts to historic properties. The Proposed Action is, therefore, in compliance with the NHPA.

5.1.1.2 The Clean Water Act

The Clean Water Act, 33 USC 1251 et seq., is the major piece of federal legislation that makes it illegal for any person, including federal agencies, to discharge pollutants from a point source into waters of the U.S. without a permit. The CWA also provides for establishment of the NPDES program for issuance of such permits. The CWA Amendments of 1987 also require that the NPDES permitting program include permits for the discharge of storm water (non-point sources of water pollution). Any construction activity that results in the disturbance of at least 1 acre, which includes clearing, grading, and excavating, must apply for an NPDES general permit for the discharge of storm water associated with construction activities.

A Notice of General Permit Coverage (NGPC) from the State of Hawaii Department of Health (DOH) for a Notice of Intent – Construction will be required. The project will adhere to MCBH's existing permits and compliance agreements including:

- NPDES No. HIS000007 (MS4 Stormwater)
- NPDES No. HI0110078 (Wastewater)
- 2022 Federal Facilities Compliance Agreement between the U.S. EPA and the U.S. Marine Corps

Also, the implementation of BMPs would confine sediment and silt runoff to the project areas, resulting in no degradation of water quality in any nearby body of water. Further, removed materials, debris, and soil resulting from the Proposed Action would be contained during demolition or construction and properly disposed of in accordance with all applicable regulations. Therefore, the Proposed Action would be in compliance with the CWA.

5.1.1.3 Sikes Act

The Sikes Act seeks to promote effectual planning and coordination of conservation and rehabilitation efforts for wildlife, fish, and game on military land. It provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, developing, and maintaining fish and wildlife resources on military reservations throughout the U.S.

In compliance with the Sikes Act Improvement Act of 1997, an *Integrated Natural Resources Management Plan* (INRMP) was developed for MCBH in 2001 and has undergone required five-year review and update (current update under preparation for five-year period 2017-2021) by the MCBH Environmental Compliance and Protection Department. The Proposed Action complies with the guidelines contained in the INRMP and supports "no net loss" in capability of the base's land and waters to support the installation's mission, while not adversely impacting fish and wildlife or other natural resources covered by the INRMP's implementation program.

5.1.1.4 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended (16 USC 1451 et seq.), is administered in Hawai'i by the State Department of Business Economic Development and Tourism's Office of Planning. The CZMA program objectives and policies are to provide coastal recreational opportunities; preserve and protect historic, scenic and coastal ecosystem resources; provide economic uses; reduce coastal hazards; improve public awareness in coastal zone management; and manage development within the coastal zone.

The CZMA requires that federal agency actions, inside and outside designated state coastal zones, that are reasonably likely to affect any land or water use or natural resources of the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the State's Coastal Zone Management Program. The proposed action falls under the Navy's CZMA De Minimis Activities List (State

of Hawaii CZMA letter, 9 July 2009) and would not result in any reasonably foreseeable direct or indirect effects to uses or resources within the Hawaii Coastal Zone (Appendix D).

5.1.1.5 The Endangered Species Act

The Endangered Species Act establishes protections for fish, wildlife, and plants that are listed as threatened or endangered; provides for adding species to and removing them from the list of threatened and endangered species, and for preparing and implementing plans for their recovery; provides for interagency cooperation to avoid take of listed species and for issuing permits for otherwise prohibited activities; provides for cooperation with States, including authorization of financial assistance; and implements the provisions of the Convention on International Trade in Endangered Species of Wild Flora and Fauna.

Informal consultation with USFWS, Pacific Islands Office was conducted under Section 7 of the ESA for the Proposed Action's potential impacts to ESA-listed species (see Appendix C for correspondence). USFWS Pacific Islands Office stated that with the incorporation of conservation measures, effects to listed species are either too small to be meaningful or measurable, or extremely unlikely to occur.

5.1.2 EXECUTIVE ORDERS

5.1.2.1 Executive Order 11988 – Floodplain Management

EO 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Neither site alternative is located in a 100-year floodplain.

5.1.2.2 Executive Order 11990 – Protection of Wetlands

EO 11990 necessitates that federal agencies implement measures that prevent the degradation of wetlands, and that construction in a wetland be the last option if no other practical alternatives can be taken. Although none of the Proposed Action sites are located in a wetland, wetland areas exist near the project areas.

The Proposed Action is not anticipated to increase or pose any risk to the wetlands in the vicinity of the project areas. Construction is not occurring within a wetland area, and no impacts are anticipated to the surrounding wetlands. Protective measures, such as containing runoff, controlling drainage, and phasing the development of projects to minimize adverse impacts, would be implemented to reduce or eliminate risk to the wetland habitats that surround MCBH. The Proposed Action would be in compliance with EO 11990.

5.1.2.3 Executive Order 13045 – Environmental Health Risks and Safety Risks to Children

The Proposed Action would have no disproportionate health or safety risks to children. The Proposed Action would occur on MCBH, where construction noise and safety risks would not affect children or the places they congregate such as schools and playgrounds. Flight operations of the C-40A would remain unchanged and would not introduce new noise sources. Because there would be no potential adverse risks, environmental health and safety risks to children were not analyzed within this EA.

5.1.2.4 Executive Order 13186 – Protection of Migratory Birds

EO 13186 was issued to assist federal agencies with their efforts to comply with the Migratory Bird Treaty Act (MBTA) (16 USC 703-711). It should be noted that the EO does not constitute any legal authorization that in any way supersedes the requirements outlined in the MBTA. The EO directs federal agencies undertaking actions that have, or are likely to have, a measurable adverse impact on migratory bird

populations to develop and implement a Memorandum of Agreement with the U.S. Fish and Wildlife Service addressing the conservation of these populations.

The implementation of the Proposed Action is not anticipated to negatively impact migratory bird species. Migratory birds at MCBH are found mostly along the peninsula's shoreline and in the Nuupia Wetland Management Area. Any displacement or disturbance of individual birds by implementing the Proposed Action would not result in measurable adverse impacts on their populations. To further reduce the potential for any impacts on migratory and local bird populations, downward-shielded exterior lighting would be used to minimize the potential for lighting to interfere with the natural behavior of birds and to prevent disorientation and the resulting collisions between birds and surrounding objects and structures. The Proposed Action would be in compliance with EO 13186 by implementing these protective measures.

6 CONSULTATION AND COORDINATION

6.1 LIST OF AGENCIES CONSULTED

Hawaii Department of Land and Natural Resources
Kalanimoku Building
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State Historic Preservation Officer
Officer Department of Land and Natural Resources
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APPENDIX A – PUBLIC COMMENTS AND RESPONSES

Public Comment Response Matrix
Draft Environmental Assessment for
P-2001 C-40 Aircraft Maintenance Hangar, MCBH
May 2023

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
1	EPA-1	US EPA Region IX	Cumulative Impacts	1	Recommendation: We recommend planning and development on MCBH be guided by a master plan that integrates the measures needed for climate change adaptation. Identify the master planning that has occurred for MCBH and the status of any update efforts in the Final EA. To improve cumulative construction-phase impact disclosure, improvements to the cumulative impact assessment are needed. In the Final EA, we recommend identifying the NEPA compliance documentation that occurred for each project and including this information in Table 4-1 along with a summary of the effects to the resources evaluated. Include a more detailed assessment in the text that follows Table 4-1 for the cumulative effects from those 10 projects that could co-occur with the Proposed Action.	Comment acknowledged.
2	EPA-2	US EPA Region IX	Cumulative Impacts	1	We also recommend identifying and including adaptation measures for this project in the Final EA. These can include, as applicable: elevating structures above flood elevation; providing shallow flood barriers; floodproofing and using flood-resistant building materials; raising electrical system components (service panels, meters, switches and outlets, and all wiring) at least a foot above expected flood levels, etc.	Structural and civil Unified Facilities Criteria (UFCs) include measures to address sea level rise, flooding, and tsunami design. This project follows UFC requirements related to these issues. A topographic survey was conducted in support of this project and found the elevations at areas around the Hanger 104 site are well above the 3.2 feet of projected Sea Level Rise levels by 2100 (State of Hawaii, 2022).
3	EPA-3	US EPA Region IX	Stormwater	1/2	Recommendation: In the Final EA, include a site plan showing proposed locations and dedicated land areas that would be utilized for LID features. Ensure these are included in the bid package and in appropriate requirements for their future continued maintenance, consistent with the FFCA.	The proposed project would be constructed with LID elements and appropriate conservation measures to the maximum extent technically feasible in accordance with UFC 3-210-10, Low Impact Development, as applicable. The project has not yet determined the specific LID features to be incorporated; therefore, a site plan is not provided at this stage showing dedicated land areas or detailing LID features.
4	EPA-4	US EPA Region IX	Biological Resources	2	Recommendation: We recommend including all the conservation measures listed in the USFWS March 22, 2023 correspondence in Table 2-3 and in the Finding of No Significant Impact (FONSI) if one is prepared.	The conservation measures listed in the USFWS March 22, 2023 letter were incorporated into Table 2-3 of the Revised Draft EA.
5	EPA-5	US EPA Region IX	Greenhouse Gas	2	Recommendation: Include in the BMP's that low GHG concrete will be included in the project specifications and in the FONSI if one is prepared. Revisit the emissions comparison component of the impact assessment methodology that is discouraged by the CEQ.	The project design will consider including GHG concrete into the project specifications. Products specified must meet design requirements and further analysis of the product is required. From a sustainability perspective, the project will comply with requirements of UFC 1-200-02 (High Performance and Sustainable Building Requirements) and requires Third Party Certification of compliance to UFC 1-200-02.
6	EPA-6	US EPA Region IX	Cultural Resources	2	Recommendation: Provide an update on the MOA in the Final EA.	Concur. MCBH and the Navy are continuing to consult with stakeholders to finalize the MOA and Section 106 consultation.
7	EPA-7	US EPA Region IX	Summary Table of Impacts	3	Recommendation: To better inform decision-makers regarding magnitude of impacts, include quantitative information from the impact assessment in Table ES-1 and Table 5-1 to differentiate impacts among alternatives.	Comment acknowledged.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
8	KNB-01	Kailua Neighborhood Board No. 31	N/A	1	The DEA does not provide the community with enough information to support a finding of "no significant impact" therefore, the Kailua Neighborhood Board recommends that a revised Environmental Assessment be conducted.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
9	KNB-02	Kailua Neighborhood Board No. 31	Cumulative Impacts	1	Any project on the Mokapu peninsula must be understood in the context of the cumulative effects of years of development and construction and not just evaluated project by project.	Analysis of cumulative impacts is included in Chapter 4 of the EA.
10	KNB-03	Kailua Neighborhood Board No. 31	DOPAA/Cultural Resources	1	The Green field site is a much more feasible site because while it has the same screening parameters and construction issues as the Preferred site the Green Field site does not demolish any historic properties or impact the historic district.	MCBH is a functional working military installation base. While construction issues may be similar at both proposed sites, many factors, in additional to cultural resources, are considered when choosing a preferred alternative. As described in the EA, Hanger 104 is the preferred alternative. MCBH consulted with the SHPO and other interested parties regarding the adverse effect and will enter into a MOA to mitigate the adverse effects. Correspondence with the SHPO and other consulting parties, can be found in Appendix B.
11	KNB-04	Kailua Neighborhood Board No. 31	DOPAA	1	When conducting the much-needed revised DEA the Navy should include a more comprehensive assessment and conceptual site plan for consideration of the Green Field as the Project site.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
12	KNB-05	Kailua Neighborhood Board No. 31	Stormwater	2	The DEA does not describe how or if the stormwater measures and storm drainage infrastructure concur with the recent EPA Federal Facility Compliance Agreement with the U.S. Marine Corps, which was issued to address significant deficiencies related to its stormwater program.	The EPA Federal Facility Compliance Agreement (FFCA) does not specifically apply at the project level, but rather the stormwater system and management as a whole. FFCA at the project level is primarily concerned with LID and BMPs, which will be incorporated per project in the specific NPDES General Permit for Construction Activities, NOI Form C. The site plan is being developed to minimize any increases in impervious areas and will maintain existing storm drainage flows. The project SOW does not include improving or modifying existing stormwater infrastructure outside the project limits. LID measures will be incorporated into the design per UFC 3-210-10. Construction BMPs will be implemented as stipulated in the project NPDES General Permit for Construction Activities, NOI Form C to be submitted.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
13	KNB-06	Kailua Neighborhood Board No. 31	Stormwater	2	In a press release the EPA states, *By addressing significant deficiencies related its stormwater program, the Marine Corps will protect cultural and recreational waters, including Kaneohe Bay, Kailua Bay and Nuupia Pond.* Considering years of previous mismanagement of stormwater runoff as indicated in the recent EPA ruling, any errors or carelessness in proposed projects can have a significant cumulative effect on the sensitive and environmentally significant ocean waters, marine environment, water quality and already stressed coral reefs surrounding the area.	Chapter 3 of the Revised Draft EA includes a description of the environmental resources and baseline conditions that could be affected from implementing the alternatives and an analysis of the potential direct and indirect effects of each alternative. All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with the NEPA, the Council on Environmental Quality, and Department of Navy guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact. Chapter 3 addresses air quality, water resources, biological resources, natural hazards and climate resiliency, cultural resources, infrastructure, hazardous materials and waste, and noise. Chapter 4 presents the Cumulative Effects Analysis.
14	KNB-07	Kailua Neighborhood Board No. 31	Stormwater	2	The DEA makes unsatisfactory statements such as 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. The DEA does not define the location or amount of the small increase of impervious surface to be added by this Project. Thus, the DEA did not evaluate the short-term, long-term, or cumulative impacts on water quality and marine life in Kailua and Kaneohe Bay from additional impervious surfaces. How much new impervious surface is considered a small increase? This question should be addressed in a revised EA.	Hanger 104 site is currently in design and the site plan is being developed to minimize any increases in impervious surfaces. Project design targets a net decrease in impervious surfaces by integrating natural treatments (e.g. bioretention, vegetated swales, and filter strips), engineered subsurface treatments (e.g. permeable pavements, water quality units), and other LID features in accordance with UFC 3-210-10. If target is not met, it is anticipated a net increase of no more than 1,500 square feet would be added.
15	KNB-08	Kailua Neighborhood Board No. 31	Stormwater	2	A revised EA is needed to evaluate the cumulative effects of decreased permeability and stormwater runoff on the natural and marine environment from projects such as this that have over the past decade reduced permeable surfaces thus creating greater opportunities for contaminated storm water runoff to reach the ocean and Nu'upia Ponds.	The site plan is being developed to minimize any increases in impervious areas. Existing storm drainage flows are maintained. The project SOW does not include improving or modifying existing stormwater infrastructure outside the project limits. LID measures will be incorporated into the design per UFC 3-210-10. Construction BMPs will be implemented as stipulated in the project NPDES General Permit for Construction Activities, NOI Form C to be submitted.
16	KNB-09	Kailua Neighborhood Board No. 31	Stormwater	2	In several areas the DEA mentions that a detention basin will be constructed to manage any increase in storm water runoff. Other than using BMPs and covering the detention basin to avoid attracting birds there is no discussion on location or dimensions of the detention basin. To understand potential impacts from the location and size of the detention basin a revised EA should be done to any identify short- and long-term impacts on the marine environment and Nu'upia Ponds.	References to retention basins are examples of Best Management Practices (BMPs) that may be implemented in the event of an increase in stormwater runoff. Table 2-2 lists Best Management Practices during Construction Activities. The Nu'upia Ponds complex is sufficiently distant from the proposed project site. Stormwater run-off and detention basins used as BMPs will have no impact on the Ponds. At the Hanger 104 site, stormwater drainage is anticipated to remain the same as current conditions and enter the existing stormwater system located on Bravo Ramp and Taxiway Tango. It is not anticipated that surface flow of water will be directed to Nu'upia Ponds from Hanger 104 or the Green Field sites. The construction of the new hangar will not significantly change sheet flow of stormwater into the Bay.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
17	KNB-10	Kailua Neighborhood Board No. 31	Cultural Resources	2	The DEA identifies Cultural Site Number 5829 as having possible traditional cultural significance and is recommended eligible for listing on the National Register of Historic Places. Has the Base begun the listing process? If so, when was the application submitted? If the Base has not begun the nomination process, please explain why. This question should be answered in a revised EA.	MCBH does not “list” National Register-eligible properties, but rather "determines them eligible" with the SHPO’s concurrence. National Register-eligible properties are given the same level of protection as “National Register-listed” properties, and both are equally subject to NRHP Section 106 (36 CFR 800).
18	KNB-11	Kailua Neighborhood Board No. 31	Air Quality	2-3	Unfortunately, the DEA defines air quality as the single action of construction and does not include long term impacts as shown in the statement: 4.1.1 Air Quality *As future projects consist principally of updated infrastructure with little new air emissions, operational air pollutant emissions from buildings 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.* Statements like those below are not useful in a NEPA document because they do not provide information on increased amounts of emissions or evaluate impacts of those additional emissions on the natural, marine, and human environment. Home basing changes in aviation operations would increase annual CO2 emissions by approximately 4, 700 tons/year and while the emission profiles of the different aircraft vary, the basing changes between 2022 and 2030 (actions described in Table 4-1) would likely cause the levels of annual criteria pollutants and carbon intensity from aviation operations at MCBH to remain the same or only slightly higher. (Emphasis added) A revised EA is needed to evaluate the cumulative impacts to air quality from an additional annual increase of CO2 emissions by approximately 4,700 tons/year and to explain what is meant by levels of annual criteria pollutants and carbon intensity from aviation operations at MCBH to remain the same or only slightly higher.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025. The Air Quality section in the Revised Draft EA has been revised.
19	KNB-12	Kailua Neighborhood Board No. 31	Air Quality	3	The DEA quotes Hawaii Administrative Rules (HAR) 11-60.1-33 Fugitive Dust as applying only to construction and demolition activities. This DEA does not address short-term or long-term or cumulative impacts of fugitive dust from this project on residents in surrounding neighborhoods and the natural and marine environment. Hawaii Administrative Rules (HAR) 11-60.1-33 Fugitive Dust (a) No person shall cause or permit visible fugitive dust to become airborne without taking reasonable precautions. Subchapter 2 GENERAL PROHIBITIONS HAR 11 -60.1-33 applies to all activities that create dust, not just construction projects. A revised EA is needed to assess not only impacts from fugitive dust short-term during construction but also long-term impacts to residents living near or on the base and the marine and natural environment from year-round activities that create dust on a daily basis.	As stated in Section 2.5 of the Draft EA, best management practices (BMPs) will be implemented to reduce particulate matter pollution (i.e. fugitive dust) during construction activities. BMPs will include, but are not limited to, 1) Use of water or suitable chemicals for control of fugitive dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land; 2) Covering all moving, open-bodied trucks transporting materials which may result in fugitive dust; 3) Prompt removal of earth or other materials from paved streets which have been transported there by trucking, earth-moving equipment, erosion, or other means; 4) No operating a diesel-powered motor vehicle which emits visible smoke for a period of more than five consecutive seconds while upon streets, roads, or highways. All construction activities would comply with the provisions of Hawaii Administrative Rule (HAR) 11-60.1-33, Fugitive Dust. In addition, Section 3.1.2. (Environmental Consequences) evaluates the effects on air quality based on estimated direct and indirect emissions associated with the action alternatives and no action alternative. The Air Quality section in the Revised Draft EA has been revised.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
20	KNB-13	Kailua Neighborhood Board No. 31	Surface Water	3	3.2.1.3 Surface Water The DEA does not provide any information on if or how storm water runoff from the Project site will be directed to the Nu'upia Ponds Complex as is the usual practice. Since Nu'upia Ponds provide significant foraging and habitat for Hawaii's endangered waterbirds a revised EA must be done to evaluate short- and long-term and cumulative impacts from this Project on the water quality of Nu'upia Ponds.	The Nu'upia Ponds complex is sufficiently distant from the proposed project site and stormwater run-off will have no impact on the Ponds. At the Hanger 104 site, stormwater drainage is anticipated to remain the same as current conditions and enter the existing stormwater system located on Bravo Ramp and Taxiway Tango. It is not anticipated that surface flow of water will be directed to Nu'upia Ponds from Hanger 104 or the Green Field sites. The construction of the new hangar will not significantly change sheet flow of stormwater into the Bay.
21	KNB-14	Kailua Neighborhood Board No. 31	Biological Resources	3	5.1.2.5 Executive Order 13186 - Protection of Migratory Birds While the DEA states The implementation of the Proposed Action is not anticipated to negatively impact migratory bird species has a Memorandum of Agreement between MCBH and U.S. Fish and Wildlife Service, which would help prevent negative impacts to migratory birds, been developed and implemented?	DoD has a MOU with the USFWS to promote the conservation of migratory birds and defines each others responsibilities relating to migratory birds. The MOU identifies specific activities where cooperation between the Parties will contribute substantially to the conservation of migratory birds and their habitats. The MOU does not alter or waive any responsibilities of DoD or FWS, as applicable, under the Migratory Bird Treaty Act, nor does it authorize the take of migratory birds.
22	KNB-15	Kailua Neighborhood Board No. 31	Climate Change	3-4	The DEA does not list any considerations of the effects of climate change, and the overall and cumulative effects of this construction on the overall resilience of the airfield. Table ES-1 Summary of Potential Impacts to Resource Areas states Less than significant impacts associated with natural hazards and climate resiliency. What does that mean? Ambiguous statements like this do not provide the reviewer with any useful information on which to evaluate impacts nor do they fulfill the purpose of NEPA which is to ensure federal agencies consider the environmental impacts of their actions and decisions. A revised EA is needed to define what the statement Less than significant impacts associated with natural hazards and climate resiliency means and provide information on how this Project and future projects will successfully manage the impacts from climate change to prevent current impacts from growing worse.	This EA was prepared pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4321 et seq.), and its implementing regulations issued by the Council on Environmental Quality (40 CFR Part 1500 - 1508), and OPNAV Manual 5090.1. Per 40 CFR 1508.27, “Significantly” as used in NEPA requires considerations of both context and intensity: (1) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, for a site-specific action, significance usually depends on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. (2) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. This criteria was used to analyze potential impacts to resource areas in this EA, including natural hazards and climate change.
23	KNB-16	Kailua Neighborhood Board No. 31	Climate Change	4	3.4.3 Mitigation Measures states No mitigation measures associated with this project would abate the long-term effects of sea-level rise at the MCHB airfield area. Longer-term and larger scope projects, such as sea walls and dunes, may be needed to have any reasonable mitigation for climate change effects, which are outside the scope of this Proposed Action. Since a 3.2-foot sea level rise would flood the Project site why are protective measures such as sea walls not included in this DEA and considered outside the scope of this project? The need for and incorporation of flood prevention measures can be discussed in the revised EA	The immediate and near future (30-40 years) of the proposed project sites, both Hangar 104 and Green Field, are not anticipated to be affected by sea level rise. A more comprehensive installation wide study and project can address these issues at a future date. This specific project's scope of work is not intended to mitigate issues affecting a large area of the installation 75-100 years from now.

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24	KNB-17	Kailua Neighborhood Board No. 31	Public Health and Safety	4	The DEA does not address effects and impacts of a tsunami even though most of the Project area is within a "Tsunami Evacuation Zone" and gives conflicting statements. Pg. 2-1 Site does not have other inherent safety risks, such as .. . /located in a tsunami evacuation zone, or located in a high flood zone. 3.4.2.2 Hanger 104 Site (Preferred Alternative) Recent changes to UFC 3-301-01 Structural Engineering require tsunami design to be incorporated into this project based on the facility's location and assigned risk category. Figure 3.4-3 100-Year Flooding under 3.2 Foot Sea level Rise with Storm waves shows the Project site impacted by 3.2-foot sea level rise. Table 5.1 Natural Hazards & Climate Resiliency states, With sea level rise, this site would be subject to increased flooding events over time. A revised EA is needed to clarify the conflicting statements and evaluate impacts from future flooding events on the ocean and land environment.	The Revised Draft EA will be revised to clarify conflicting statements and evaluate impacts from potential future flooding events.
25	KNB-18	Kailua Neighborhood Board No. 31	Biological Resources	4	Noise 3.3 Biological Resources This section states, Operational noise over marine waters of Kaneohe Bay will be virtually the same as existing conditions and there would be no effect to EWA-listed marine species. Therefore, potential impacts to marine species are not further analyzed in this EA. If impacts from noise was declared insignificant, negligible, or nonexistent therefore, not evaluated in this DEA how was the conclusion reached that there would be no potential impacts to marine species?	The Revised Draft EA includes the addition of a Noise Study in Appendix F.
26	KNB-19	Kailua Neighborhood Board No. 31	Environmental Justice	4	3 Affected Environment and Environmental Consequences Environmental Justice: The Proposed Action would not have a disproportionate impact to Native Hawaiians, minority or low-income populations or children. If impacts from noise was considered insignificant, negligible, or nonexistent and not evaluated in this DEA how was the conclusion reached that there would be no potential impacts to people living on and off the base? Noise impacts to adjacent communities and those across Kaneohe Bay from repositioning the 2-engine C-40 near BRAVO facing residents across the bay should have been evaluated in this DEA. A revised EA is needed to conduct noise evaluations on the marine environment and people living in surrounding communities and on base residents because they are not insignificant.	The Revised Draft EA includes the addition of a Noise Study in Appendix F.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
27	KNB-20	Kailua Neighborhood Board No. 31	Geological Resources, Land Use, Airspace, Noise, Transportation, Socioeconomics and Environmental Justice.	5	The DEA states that potential impacts were considered to be insignificant, negligible, or nonexistent, the following resources were not evaluated in this EA: Geological Resources, Land Use, Airspace, Noise, Transportation, Socioeconomics and Environmental Justice. Thus, a decision was made but not evaluated in this EA: Geological Resources, Land Use, Airspace, Noise, Transportation, Socioeconomics and Environmental Justice.	The Revised Draft EA analyizes Noise and includes a Noise Study in Appendix F. All potentially relevant environmental resource areas were initially considered for analysis in the EA. In compliance with the NEPA, the Council on Environmental Quality, and Department of Navy guidelines; the discussion of the affected environment focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact. The potential impacts to the following resource areas are considered to be negligible or non-existent so they were not analyzed in detail in this EA : Geological Resources, Visual Resources, Land Use, Airspace, Transportation, Socioeconomics and Environmental Justice.
28	KNB-21	Kailua Neighborhood Board No. 31	Socioeconomics	6	Page 3-2 Socioeconomics states If a third aircraft is provided to the VR-51, minor increases in squadron staff could occur but would not affect socioeconomics of the region. What socioeconomic region does this statement refer to - Marine Corps Base Hawaii, the communities of Kaneohe and Kailua, or all three? Is this statement a hint that more aircraft may or will be added to the base in the future? Will the adding additional aircraft trigger another EA? A comprehensive look at the socioeconomic impacts from this Project cannot be ignored and must be included in a revised EA.	Currently, two aircraft are stationed at MCBH. There are no current plans to add a third aircraft. Revised Draft EA has been revised for clarification.
29	WC-01	Windward Coalition	Cumulative Impacts for Noise, Cultural Resources, Biological Resources, Stormwater, Water quality, Air Quality	1	The Draft Environmental Assessment (DEA) does not provide an adequate evaluation of cumulative impacts including but not limited to noise, demolition of multiple buildings on burials, historic buildings, historic districts, endangered species, storm water runoff, water quality and air quality.	The Revised Draft EA includes a Noise Study in Appendix F. This EA was prepared pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4321 et seq.), and its implementing regulations issued by the Council on Environmental Quality (40 CFR Part 1500 - 1508), and OPNAV Manual 5090.1. This EA ensures that comprehensive and systematic consideration is given to potential environmental impacts that may result from implementing the Proposed Action, or any reasonable alternative action, upon the natural, man-made, or social environment. Based on the analysis of environmental impacts of the Proposed Action and the No Action Alternative, this EA concludes that no significant adverse environmental impacts are expected as a result of implementing the Proposed Action.
30	WC-02	Windward Coalition	DOPAA	1-2	The Navy was aware that the C-40 was too large for the hangar used by smaller C-20s. Yet, these aircraft arrived at MCBH 4 years ago without a designated hangar. In this DEA, they propose demolition of another historic hangar (104) and rebuilding of a Type 3 hangar to house the 2 aircraft. This request should have been included in the recent EA for home basing C-130Js and MQ-9s. Instead of "piecemealing" these 2 submissions - both of which are inadequate in addressing environmental impacts.	Comment acknowledged.
31	WC-03	Windward Coalition	FONSI	2	The DEA does not provide the community with enough information to support a "finding of no significant impact."	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
32	WC-04	Windward Coalition	Cumulative Impacts for noise, socioeconomic and environmental justice		We disagree with the exclusion of cumulative noise, socioeconomic and environmental justice evaluations and believe they warrant inclusion.	Comment acknowledged. Because potential impacts were considered to be insignificant, negligible or nonexistent, these resources were not evaluated in this EA.
33	WC-05	Windward Coalition	Noise	2	In the preferred location, two 2-engine C-40s would be repositioned on or near BRAVO ramp, a more noise-sensitive location facing the community. The cumulative noise will significantly worsen by the recently approved move of at least one MV-22 squadron to BRAVO ramp.	Aircraft access is from Taxiway Tango. The C-40s will not be on Bravo Ramp.

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34	WC-06	Windward Coalition	Noise	2	In a recent meeting with community stakeholders, MCBH stated that there was noise modeling performed at the time of the previous EA - approved as a FONSI. However, despite requests for details, this information was withheld from the community. Without the details, an adequate evaluation of cumulative noise impact on the community is difficult if not impossible to assess.	The Revised Draft EA includes the addition of a Noise Study in Appendix F.
35	WC-07	Windward Coalition	Noise	2	Noise: The movement of the C-40 to a new location should be evaluated in a cumulative noise model at both possible sites for the hangar - the preferred location on Bravo Ramp and the alternative at Green Field. This cumulative noise model should include the newly approved locations of Ospreys and the C-40s to BRAVO ramp. The noise modeling should include all aircraft both from this DEA and the previous one with details of the noise modeling shared with the community.	The Revised Draft EA includes the addition of a Noise Study in Appendix F.
36	WC-08	Windward Coalition	Socioeconomics	2	Socioeconomics: The DEA should include more information on the effects of more activity on the community. Generally, the more active the airport, the poorer the surrounding community. The increased noise and effects on air quality from construction and aviation activities has been linked to health issues and decreased learning in children.	The Revised Draft EA includes the addition of a Noise Study in Appendix F.
37	WC-09	Windward Coalition	Environmental Justice	2-3	The Navy implies that the proposed action would have no disproportionate impacts to minority or low-income populations. We disagree. For example, in the most affected area, Kaneohe, native Hawaiians, Pacific Islanders and Hispanics represent 63% of those falling under the "poverty" designation.	The Revised Draft EA includes the addition of a Noise Study in Appendix F.
38	WC-10	Windward Coalition	Cumulative Impacts for Stormwater	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not adequately discuss the cumulative effects of stormwater runoff and decreased permeability from past and future projects.	The site plan is in development for the Hangar 104 site and will minimize increases in impervious areas with a goal of no added impervious area. Stormwater drainage is anticipated to remain the same as current conditions by utilizing the existing stormwater system. LID features in accordance with UFC 3-210-10 will be implemented to the maximum extent technically feasible. The Green Field site will decrease surface permeability by approximately 8 acres and increase stormwater runoff accordingly. The Green Field site is not the preferred alternative; therefore, the impacts of the additional 8 acres of impervious surface stormwater runoff has not been evaluated in this EA.
39	WC-11	Windward Coalition	Stormwater	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not describe adequate details of the proposed plan for stormwater measures and storm drainage infrastructure to concur with the EPA stormwater consent decree between the Marine Corps Base and EPA, which was issued for violations to the existing National Pollutant Discharge Elimination System (NPDES) storm water permit.	The EPA FFCA does not specifically apply at the project level, but rather the stormwater system and management as a whole. FFCA at the project level is primarily concerned with LID and BMPs, which will be incorporated per project in the specific NPDES General Permit for Construction Activities, NOI Form C. The site plan is being developed to minimize any increases in impervious areas and will maintain existing storm drainage flows. The project SOW does not include improving or modifying existing stormwater infrastructure outside the project limits. LID measures will be incorporated into the design per UFC 3-210-10. Construction BMPs will be implemented as stipulated in the project NPDES General Permit for Construction Activities, NOI Form C to be submitted.
40	WC-12	Windward Coalition	DOPAA	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not provide information on the location, dimensions, capacity, etc. of the new stormwater detention basin.	For the Hangar 104 site, the project does not include a Storm Water Detention Basin because no additional water runoff from current conditions is anticipated and detention basins have a propensity to attract birds. For the Green Field site, with up to 8 acres of new impervious surfaces added to the baseline, a detention basin may be required. Locations, dimensions, capacity will be calculated by the Design Team.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
41	WC-13	Windward Coalition	Stormwater	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA makes statements such as 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 stormwater flow going into Kaneohe Bay from current conditions without defining the increases and impacts on the bay and its marine life.	Hangar 104 and surrounding apron are mostly impervious areas with stormwater runoff flowing to existing drainage facilities along Taxiway Tango and Bravo Ramp. New hangar and surrounding apron areas will potentially decrease impervious surface areas (to be calculated and confirmed thru LID design measures) which in turn will reduce flow to the existing drainage system from current conditions. For the Green Field site, the entire site will change from pervious to impervious surfaces. The Final EA includes drainage and LID requirements to minimize and contain runoff.
42	WC-14	Windward Coalition	Environmental Consequences	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not define "less than significant" or "small" increases.	This EA was prepared pursuant to the National Environmental Policy Act (NEPA), as amended (42 USC 4321 et seq.), and its implementing regulations issued by the Council on Environmental Quality (40 CFR Part 1500 - 1508), and OPNAV Manual 5090.1. Per 40 CFR 1508.27, “Significantly” as used in NEPA requires considerations of both context and intensity: (1) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, for a site-specific action, significance usually depends on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. (2) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. This criteria was used to analyze potential impacts to resource areas in this EA, including natural hazards and climate change.
43	WC-15	Windward Coalition	Biological Resources	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not explain what is meant by "no brighter than necessary" when referring to lighting and impacts on migratory birds.	"No brighter than necessary" means to eliminate excessively bright lights and light the area well enough to accomplish the task at hand while reducing or eliminating, back light, uplight, and glare to the maximum extent possible. This will be defined in the Final EA.
44	WC-16	Windward Coalition	Biological Resources	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not explain the circumstances under which pre-approval would be necessary for construction lighting.	This requirement for pre-approval during night-time construction is to reduce seabird fallout and to avoid lighting up the area during season of seabird fledging, particularly during the new moon phases when the area is darkest and lights would be much more likely to attract seabirds. The Section 7 consultation with USFWS addresses ESA species and lighting in Appendix C of the Final EA.
45	WC-17	Windward Coalition	Biological Resources	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA does not identify impacts from day and nighttime construction work and construction lighting on listed endangered birds, which are known to fly over and inhabit the base.	This requirement for pre-approval during night-time construction is to reduce seabird fallout and to avoid lighting up the area during season of seabird fledging, particularly during the new moon phases when the area is darkest and lights would be much more likely to attract seabirds. The Section 7 consultation with USFWS identified the lighting concerns, analyzed impacts, and a determined mitigations that would be implemented to avoid/minimize impacts on ESA species.
46	WC-18	Windward Coalition	Cumulative Impacts for Air Quality	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA only considered the impact of construction on air quality and did not address cumulative impacts from past actions and projects. Cumulative impact was considered to be unchanged despite the marked increase in aircraft operational tempo outlined in the previous EA.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
47	WC-19	Windward Coalition	Air Quality	3	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. The DEA (Sec 3.1.1.1) states that "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." This statement is confusing. While Hawaii is in attainment of the federal and state standards, this project must still comply with applicable federal or state laws/rules.	The Clean Air Act Amendments of 1970 instruct the U.S. Environmental Protection Agency (U.S. EPA) to set primary National Ambient Air Quality Standards (NAAQS) to protect public health, and secondary NAAQS to protect plants, forests, crops and materials from damage due to exposure to six air pollutants. CAA's General Conformity Rule ensures that federal activities do not cause or contribute to new violations of NAAQS and that actions do not worsen existing violations of the NAAQS. As the DEA states, that state of Hawaii is in attainment of NAAQS. Construction activities during implementation of the proposed action alternatives would generate short-term, temporary air emissions such as fugitive dust and combustion of fossil fuels from construction equipment.
48	WC-20	Windward Coalition	Air Quality	4	As there are 2 sites under consideration - Hangar 104 and Green Field, all comments below refer to both proposed locations. Although 10 percent or more of aircraft pollutants are emitted during taxi, takeoff, initial climb, and during the approach and landing and even more generated by prolonged runups and maintenance on the ground these cumulative effects are not addressed. Additionally, the DEA does not fully account for the added ground service equipment and other service vehicles with these same emissions required to service the additional aircraft, further contributing to aviation's impact on local air quality. This significant increase in aircraft requires additional auxiliary power units that also generate pollutants.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
49	WC-21	Windward Coalition	Cumulative Impacts	4	Without the above noted cumulative information, it is difficult to definitively comment on the 2 alternative sites for the proposed hanger. That said, from presented comparisons of effects on archaeological resources, natural hazards and climate resiliency, Green Field appears to be the superior option. In conclusion, this DEA does not provide the community with enough information to support a finding of no significant impact. A deeper look should be done to address the community's cumulative environmental concerns.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
50	I-MM-01	Mary Ann Mack	General	1	I am in agreement with the attached counter-points of the Windward Coalition and also with the Kailua Neighborhood Board for the need of additional evaluation for noise and other potential environmental impacts that the MCBH plan of hangar construction and replacement of new and current aircraft would generate. I urge you to reconsider your finding of ‘no significant impact’ and to issue a much more comprehensive study to address these issues.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
51	I-CC-01	A Concerned Citizen of the State of Hawaii	DOPAA	2	This hangar demolition and construction project should have been considered in the NEPA document for home-basing of the C-40. It is implausible that the Navy was unaware a C-40 was too large for the hangar when it decided to change from a much smaller C-20 aircraft to the C-40 just 4 years ago in 2019. For those of us who live in the shadows of MCBH, it is very noticeable when aircraft change but I always assumed that the government followed the law, until recently. Navy's dismissive handling of Red Hill and their blatant disregard for noise concerns surrounding the MQ-9s and KC-130 issues has crushed public trust. The critical issues within this EA are so obvious it's insulting to the public, especially those that live next door.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
52	I-CC-03	A Concerned Citizen of the State of Hawaii	General	2	Some basic questions have not been answered. For example, the EA for Home Basing of MQ-9 and KC-130J aircraft at MCBH considered hangar replacement requirements prior to making a home basing decision; so where is the EA or EIS for home basing the C-40 and why didn't it consider this hangar construction project, requiring this separate EA?	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
53	I-CC-04	A Concerned Citizen of the State of Hawaii	DOPAA	2	Why didn't Navy consider hangar size before deciding the home base for the C-40?	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.

Item No.	Comment No.	Commenter Name/Org	Resource Area	Comment Submittal Page No.	Comment	Draft Response
54	I-CC-05	A Concerned Citizen of the State of Hawaii	Noise	2	Where are the noise comparisons for the C-40 aircraft compared to the C-20 aircraft and where is the noise data?	The Revised Draft EA includes a Noise Study in Appendix F.
55	I-CC-06	A Concerned Citizen of the State of Hawaii	Noise	2	How is the total noise being accounted for at MCBH when there are major aircraft changes happening every few years?	The Revised Draft EA includes a Noise Study in Appendix F.
56	I-CC-07	A Concerned Citizen of the State of Hawaii	DOPAA	2	How long has the Navy been planning this hangar demolition and construction project?	Preliminary Design Authorization for P-2001 was given in October 2020.
57	I-CC-08	A Concerned Citizen of the State of Hawaii	DOPAA	2	How has the Navy accounted for the environmental impacts of the home basing of the C-40 since 2019?	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
58	I-CC-09	A Concerned Citizen of the State of Hawaii	DOPAA	2-3	Navy's decision to bring in new aircraft that can't fit into existing hangars doesn't make logical sense. It appears Navy unilaterally decided to move aircraft into a historic hangar that is too small so they can argue that they need to tear down a historic hangar to support an "existing" requirement. This is just another example of Navy deceiving the people of Hawaii, just like Red Hill, and manufacturing a requirement that negatively affects our community and resources with complete disregard of the 'aina. If this kind of ridiculous disregard for basic planning is allowed to continue, where will it stop? Next thing we know, the Navy will tell us that they have to refill the fuel tanks at Red Hill in a few short years just because there are giant tanks sitting empty.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.
59	I-CC-11	A Concerned Citizen of the State of Hawaii	General	Letter	Editor's note: It has been requested that at letter which was submitted for FOIA request regarding various documents for home-basing the C-40 airframe at MCBH be entered into the public comment record for this project.	The Navy circulated the Draft EA for public review from May 17, 2023 to June 16, 2023. Substantive public comments were received that required the Navy and VR-51 to relook at the proposed action and potential impacts. The Draft EA has been revised and will be recirculated for another formal public review in early 2025.

APPENDIX B – NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION

UNITED STATES MARINE CORPS
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5090
LFE/204-21
29 Nov 21

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

Dear Dr. Downer:

SUBJECT: SECTION 106 CONSULTATION (Architecture & Archaeology): MILCON P-2001 C-40 Aircraft Maintenance Hangar & Parking Apron Aboard Marine Corps Base Hawaii, District Of Koʻolaupoko, Ahupuaʻa Of Heʻeia, On The Island Of Oʻahu, 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. Naval Air Force Reserve (Navy) to implement Military Construction Project (MILCON) P-2001 C-40 Aircraft Maintenance Hangar & Parking Apron at the Kaneohe Bay installation. 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 C-40 Aircraft Maintenance Hangar and Parking Apron project is located in the southwest portion of Mokapu Peninsula (enclosure 1). The project area is centered around Hangar 4 (Facility 104), bounded by 1st Street on the north, Hangar 3 (Facility 103) on the east, Bravo Ramp on the south, and Taxiway Tango on the west (enclosure 2). The project proposes to construct a new C-40 aircraft maintenance hangar and parking apron for the Navy's Fleet Logistics Support Squadron Five One (VR-51). VR-51 is a tenant command that currently operates aircraft out of Hangars 4 and Hangar 5 (Facility 105) at MCBH. In 2019, the VR-51 squadron transitioned from two C-20G aircraft to two C-40 aircraft, which Hangars 4 and 5 are unable to accommodate. The C-40s are a larger aircraft, and these existing hangars are too small for both their wingspan and tail height. There are no existing hangars available at MCBH that can adequately accommodate C-40 aircraft requirements. Currently, the C-40 aircraft are parked in the open on the Hangar 5 apron where inclement weather poses multiple risks if they are in non-flyable status during such an event.

In 2020, the Navy carried out an Engineering Study to determine the feasibility of altering Hangar 4 to accommodate two (2) C-40 aircraft (Nagamine Okawa Engineering et al. 2020). After applying the horizontal and vertical clearances from FRD and UFC guidelines, the study concluded that modifications could not achieve the required horizontal clearances for the main wing. To meet the vertical clearances for the plane's tail, the study concluded that the roof, framing, and vertical lift doors would need to be modified to increase the height. In addition to the roof and framing alterations, the vertical lift doors would need to be raised from their current height of 38'-9" to 56'-3", based on the manufacturer's recommendation for C-40A's tail clearance requirements, projecting the housing above the roofline for the tail

clearance (enclosures 3-4). In sum, altering Hangar 4 to meet the vertical clearance requirement would significantly alter the appearance of the hangar but still not achieve adequate horizontal clearance.

Based on this conclusion, the Navy determined to provide maintenance and support spaces for the VR-51's C-40 aircraft with a new Type III hangar. The new hangar will have a steel-frame construction with standing seam metal roofing, concrete filled metal deck floors, and a pile foundation (enclosures 5-6). Hangar 5 will be used as swing space for VR-51 during the construction phase of P-2001. The proposed scope of work will include: (1) demolition of Hangar 104; (2) replacement of existing apron pavement around Hangar 104; (3) demolition of Building 4048 (gate/sentry house) and Building 4042 (generator building); (4) construction of a Type III high-bay aircraft maintenance hangar with low-rise space for administration, maintenance and aircraft/spares storage; (5) installation of pedestrian sidewalks; and (6) upgrades to associated utilities (see enclosure 2). In addition to providing a weather-protected shelter for inspection, service, and maintenance of the C-40 aircraft, the project also provides maintenance and storage space for a P-8A Detachment currently located at MCBH.

AREA OF POTENTIAL EFFECTS

The Area of Potential Effects (APE) has been determined to include the footprint of the P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron project and the surrounding Naval Air Station (NAS) Kaneohe Aviation Historic District as shown on enclosure 7. A significant component part, and individually listed district within the Aviation District, is the Kaneohe Naval Air Station National Historic Landmark District (NHL).

IDENTIFICATION OF HISTORIC PROPERTY

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 the area of potential effects (APE) in accordance with the Secretary of the Interior's Standards and Guidelines for Identification.

Architecture

The Kaneohe Naval Air Station Historic Aviation District contains approximately 53 contributing architectural resources, and of which Hangar 104 is a contributing resource. The district and its architectural resources have been determined to be eligible for the Hawaii State and National Registers of Historic Places (NRHP) under Criteria A (American history) and C (architecture). A significant component part, and individually listed district within the Aviation District, is the Kaneohe Naval Air Station National Historic Landmark District (NHL). Buildings 4048 and 4042, slated for demolition as part of this project, were built in 1987 and are neither eligible for the NRHP or contributing resources to the two historic districts (enclosure 8).

Archaeology

Based on archaeological evidence, people were present on Mōkapu Peninsula at least 500 to 800 years before Western Contact (Tomonari and Clark-Tuggle 2021:II-15). To date, three traditional Hawaiian archaeological sites (Sites

50-80-11-04453, -04933, and -05829) have been identified in the vicinity of the current APE (enclosure 9). These sites are located near the former southern shoreline as it existed prior to the fill events—described below—of the late 1930s and early 1940s (Dixon et al. 2002; Gosser et al. 2002; Prishmont et al. 2001; Rechtman and Wolforth 2000; Riford et al. 2004). These archaeological resources are listed individually in Table A: Summary of Archaeological Sites within the APE.

Expansion of the air station between 1939 and 1945 involved extensive dredging of marine sediment from the bay and the deposition of the material on and adjacent to the shoreline and other low areas to create new, dry land (Devaney et al. 1982:115–116). Enclosure 9 shows the three archaeological sites' locations and the former shoreline, which was drawn from a historical topographic map (USGS 1928). Major construction projects at the station were concluded with the end of the war in 1945, and many of the World War II (WWII) structures remain standing today (Tomonari-Tuggle and Clark 2021:II-64). An overview and context of the archaeological resources near and within the APE are provided below. With respect to archaeology, previous archaeological studies have identified three eligible archaeological deposits and/or sites in the western portion of Mōkapu Peninsula (Sites 50-80-11-04453, -04933, and -05829) as shown on enclosure 9. These archaeological properties are not likely to be affected by this undertaking. They are significant and of value chiefly for the information on prehistory or history they are likely to yield through archaeological, historical, and scientific methods of information recovery.

Site 50-80-11-04453, represented by two subsurface cultural deposits, is located adjacent to the former southern shoreline and wetland area near Hangar 105, approximately 250.0 m west of Hangar 104 (enclosure 10). This marshland environment is known to have been used for traditional Hawaiian habitation and related activities (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). The site contains archaeological features and artifacts indicative of pre-Contact habitation and marine exploitation. In addition, human remains were exposed in a disturbed context just below a landfill stratum (Charvet-Pond and Rosendahl 1992b). The site was recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021). Several previous archaeological investigations have identified the boundaries of the subsurface cultural deposit (see Table A: Allen 2015; Charvet-Pond and Rosendahl 1992a,b; Gosser et al. 2002; Prishmont et al. 2001; Rasmussen 2007; Rosendahl 1999 and enclosure 11).

This project described above, shown in enclosure 2, and the above summary of background research indicate that planned ground disturbance is outside the known boundaries of Site 04453. Previous archaeological investigations (Allen 2015; Charvet-Pond and Rosendahl 1992a,b; Gosser et al. 2002; Prishmont et al. 2001; Rasmussen 2007; Rosendahl 1999) found no evidence of cultural deposits in the project area. These studies show that the area of proposed ground disturbance will be located approximately 200 m to the east of the cultural deposits associated with Site 04453. Prishmont et al. (2001) reported that Profile 42 (see enclosure 12), located at the northwest corner of Hangar 105 and recorded during the BRAC project, shows remnants of a Layer IV that was interpreted to be a possible vegetated wetland soil. It was potentially associated with Site 04453 but lacks any cultural materials. Layer IV was noted to be more distinct in Profiles 43-44 on the south and SE side of Hangar 105, suggesting that the Site 04453 deposits are to the south,

Table A. Summary of Archaeological Sites within APE

SIHP Site No. 50-80-11-	Period	Description	NRHP Significance	Soil Stratigraphy	References
04453	Pre-Contact	Subsurface cultural deposit with pit features, postmolds, shell midden, charcoal; intact burials	D, recommended eligible for listing on the NRHP (SHPO concurrence not yet received)	Dark grayish brown sandy loam, 20 cm thick, beneath fill	Charvet-Pond and Rosendahl 1992a, 1992b; Prishmont and Anderson 2000; Prishmont et al. 2001; Gosser et al. 2002; Rasmussen 2007a; Nickelsen and Kirkendall 2008a
04933	Pre-Contact	Subsurface cultural deposit, with pits, postholes, firepits; bone arrow point	D, recommended eligible for listing on the NRHP (SHPO concurrence not yet received)	Black loamy sand, up to 15–20 cm thick, beneath fill and Ewa-series soils	Schilz and Allen 1996; Rechtman and Wolforth 2000; Allen 2000; Prishmont et al. 2001; Gosser et al. 2002; Nickelsen and Kirkendall 2008b
05829	Pre-Contact	Subsurface cultural deposit and burials; around Building 6470, north of Hangar 104	D, recommended eligible for listing on the NRHP (SHPO concurrence not yet received)	Very dark gray to black silt loam to loamy sand, 4¬¬–20 cm thick, beneath fill and in some areas a thin gley layer	Prishmont et al. 2001; Roberts et al. 2002; Dixon et al. 2002; Nickelsen and Kirkendall 2008c; Allen and Rieth 2014; Allen 2015; Barna et al. 2017; Filimoehala et al. 2020

east, and west of Hangar 105 but are lacking to the north. In summary, these reports show no potential for this undertaking to encounter unknown archaeological deposits in the project area.

Site 50-80-11-04933 is located approximately 285.0 m north of Hangar 104 and is also adjacent to the former southern shoreline (enclosure 8). It is situated on a former sand beach ridge between two former wetlands, which are all now buried. Like Site 04453, Site 04933 is also represented by two subsurface cultural deposits containing features (e.g., subsurface hearths) and artifacts indicative of pre-Contact habitation and marine exploitation. One human burial was also recorded at Site 04933. Several previous archaeological investigations have identified the boundaries of the subsurface cultural deposit (Table A: Prishmont et al. 2001; Rechtman and Wolforth 2000; Schilz and Allen 1996; and displayed in enclosure 13). The intact subsurface human interment was recorded beneath fill and Ewa-series soils and above or on beach sand associated with the former shoreline. The site was recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021).

This project described above, shown in enclosure 2, and the above summary of background research indicate that planned ground disturbance is outside the known boundaries of Site 04933. Previous archaeological investigations (Table A) found no evidence of cultural deposits in the project area. These studies show that the area of proposed ground disturbance will be located approximately 280 m to the south of the cultural deposits associated with Site 04933. Archaeological monitoring conducted in support of the BRAC program exposed the Site 04933 subsurface cultural deposit (Layer III) containing sparse charcoal in Profiles 14–16 (enclosure 14). These profiles were recorded approximately 12.0 and 24.0 m north of the northern boundary of the site as documented by Rechtman and Wolforth (2000), indicating the site boundary needed to be expanded northward (Prishmont et al. 2001:53). In summary, these reports show no potential for this undertaking to encounter unknown archaeological deposits in the project area.

Site 50-80-11-05829 was recorded by Prishmont et al. (2001) and is located less than 20.0 m northeast of Hangar 104 (also shown at enclosure 8). The site is located on the same former sand beach ridge at Site 04933 (enclosure 9). Four traditional Hawaiian burials and two other possible burial pits were recorded. Other than one smoothed pebble within one pit feature, no other cultural materials were found in association with the burials. Several previous archaeological investigations (Table A: Allen 2015; Allen and Rieth 2014; Barna et al. 2017; Dixon et al. 2002; Filimoehala et al. 2020; Fong 2021; Prishmont et al. 2001; Roberts et al. 2002) have identified the boundaries of the Site 05829 subsurface cultural deposit as shown at enclosure 13. Similar to Sites 04453 and 04933, Site 05829 has been recommended eligible for the NRHP under Criterion D (Tomonari-Tuggle and Clark 2021).

This project described above, shown in enclosure 2, and the above summary of background research indicate that planned ground disturbance is outside the known boundaries of Site 05829. Previous archaeological investigations (Table A: Allen 2015; Allen and Rieth 2014; Barna et al. 2017; Dixon et al. 2002; Filimoehala et al. 2020; Fong 2021; Prishmont et al. 2001; Roberts et al. 2002) found no evidence of cultural deposits in the project area. These studies show that the area of proposed ground disturbance will be located approximately 15.0 m to the south of the cultural deposits associated with Site 5829.

Enclosures 15-19 show the 1928 coastline and wetlands superimposed on various site plans for this undertaking. The proposed ground disturbance is partially within the former wetland boundary. This land was built of crushed coral rock dredged from the bay in the early 1940s during initial construction of the Naval Air Station. Thus, the proposed ground disturbance in this area has no potential to encounter any archaeological sites or deposits. Boring sample east of the wetlands (see Fong 2021), which are also superimposed on site plans shown at enclosures 17-21, yielded no conclusive evidence of a cultural deposits. Testing north of Hangar 104 along First Street (see enclosure 8) has placed the southern extent of Site 5829 outside of the proposed ground disturbance for this undertaking. Only Boring Sample 6 documented in Fong (2021) contained possible evidence of an A horizon (enclosure 20), which was taken just south of Site 5829. The layer was identified at the base of excavation and was only 5–7 cm thick; no cultural material was observed. Due to the inconclusive nature of the testing and limited sample size relative to the project area, subsurface testing consisting of test trenching/units was recommended for any future work in in the area. In summary, these reports show low potential for this undertaking to encounter unknown archaeological deposits in the project area.

Based on the summary of archaeological information provided above, the proposed undertaking will result in no adverse effects to sites 04453, 04933, or 05829. Previous archaeological investigations in the immediate vicinity of the area of proposed ground disturbance found no conclusive evidence of cultural deposits associated with the three sites, which are located to the west and north of Hangar 104 and outside the current project area. Although Site 05829 extends into First Street, previous archaeological investigations show there is low potential for this undertaking to encounter any cultural deposits associated with Site 05829 because the First Street corridor has been heavily disturbed to depths below the cultural layer by an extensive network of subsurface utilities. Additionally, there is no potential for this undertaking to encounter any archaeological deposits or sites in portions of the peninsula where the ground was formerly under Kāneʻohe Bay waters and built of crushed coral rock dredged from the bay during the 1940s. The more likely historic or cultural resource to be encountered during the current undertaking is disarticulated, secondarily-deposited human skeletal remains brought into the APE with Jaucas sand mined elsewhere on the peninsula (Tomonari-Tuggle and Clark 2021:II-87, II-114, II-128). The Jaucas sand was used as a base grade and around pipes in excavated trenches during the 1940s. As a best management practice, a qualified archaeologist should monitor all ground disturbance associated with this undertaking. All cultural resources, if encountered, shall be documented as appropriate by the archaeological monitor, and treatment of the findings, if any, shall proceed in accordance with the AMP.

In conclusion, subsurface testing consisting of test trenching/units has been recommended for any future work in the area, and MCBH is proposing to conduct archaeological monitoring designed to do data recovery for all ground disturbing activities associated with this undertaking. All archaeological deposits, if encountered, shall be documented as appropriate by the archaeological monitor, and treatment of the findings, if any, shall proceed in accordance with an Archaeological Monitoring Plan (AMP) submitted for review and approval by the MCBH Cultural Resources Manager (archaeologist) prior to the start of ground disturbing activities.

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 so the members of the public will have 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 an adverse effect on historic properties in accordance with Section 106 Implementing Regulations at 36 CFR 800.5(a)(1) based on the following: 1) demolition of Hangar 4, which is eligible for the National Register as a contributing element of the NAS Kaneohe Aviation Historic District. 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) will be consulting 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 be notifying the Advisory Council on Historic Preservation (ACHP) of this adverse effect finding in order to determine its participation in this consultation, pursuant to Section 106 Implementing Regulations at 36 CFR 800.6(a)(1).

MCBH will be holding a virtual meeting [Webex, MS Teams, or teleconference] on **Thursday, 09 December 2021, at 9:00 a.m.** to discuss development of a memorandum of agreement (MOA) to resolve the adverse effects described above. We will provide instructions for joining closure 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,

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

Enclosure:
1. Map showing the general location of the C-40 Aircraft Maintenance Hangar & Parking Apron project in the southwest portion of Mokapu Peninsula.
2. Plan drawing showing the project footprint, bounded by 1st Street on the north, Hangar 3 on the east, Bravo Ramp on the south, Taxiway Tango on the west.
3. Drawing A-202 showing that modifications to Hangar 4 would not be able to achieve the required horizontal clearance for the C-40s in the hangar.
aircraft in Hangar 4.
4. Drawing A-203 showing that modifications to Hangar 4 to meet vertical clearance requirements would significantly alter the appearance of the hangar but nonetheless fail to meet horizontal clearance requirements.
5. Rendering of the front view of the new Navy hangar.
6. Massing of the front view of the new Navy hangar.
7. Map showing the Area of Potential Effect (APE) for the P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron project including the project footprint and the surrounding Naval Air Station (NAS) Kaneohe Aviation Historic District.
8. Distribution of Exiting Buildings, former wetlands, and Site 4933 and Site 5829.
9. Distribution of Previously Identified Archaeological Sites Near Hangar 104 in Relation to the Historic Shoreline and Fill Land.
10. Distribution of Existing Buildings, Former Wetlands, 1928 Shoreline, and Site 4453.
11. Previous Archaeological Investigations Near Site 4453.
12. Soil Profiles Recorded By Prishmont et al. (2001: Figure 11) Under Task Order 5.
13. Previous Archaeological Investigation Near Site 4933 and Site 5829.
14. Soil Profiles Recorded By Prishmont et al. (2001: Figure 11) Under Task 1.
15-19. 1928 coastline and wetlands superimposed on various site plans for this undertaking.
20. Locations of Boring Test Samples Documented in Fong (2021).

Copy to:

Chair, Oahu Island Burial Council (via Regina Hilo, SHPD)
Chair, Office of Hawaiian Affairs
Ms. Anuhea Diamond, Diamond ʻOhana
Ms. Skye Razon-Olds, Olds ʻOhana
Ms. Emalia Keohokalole, Keohokalole ʻOhana

Mr. Norman Llanos, Prince Kuhio Hawaiian CC
Ms. Na`u Kamali`i, Boyd ʻOhana
Ms. Donna Ann Camvel, Paoa Kea Lono ʻOhana
Mr. Cy Harris, Kekumano ʻOhana
Ms. Terrilee Napua Keko`olani Raymond, Keko`olani ʻOhana
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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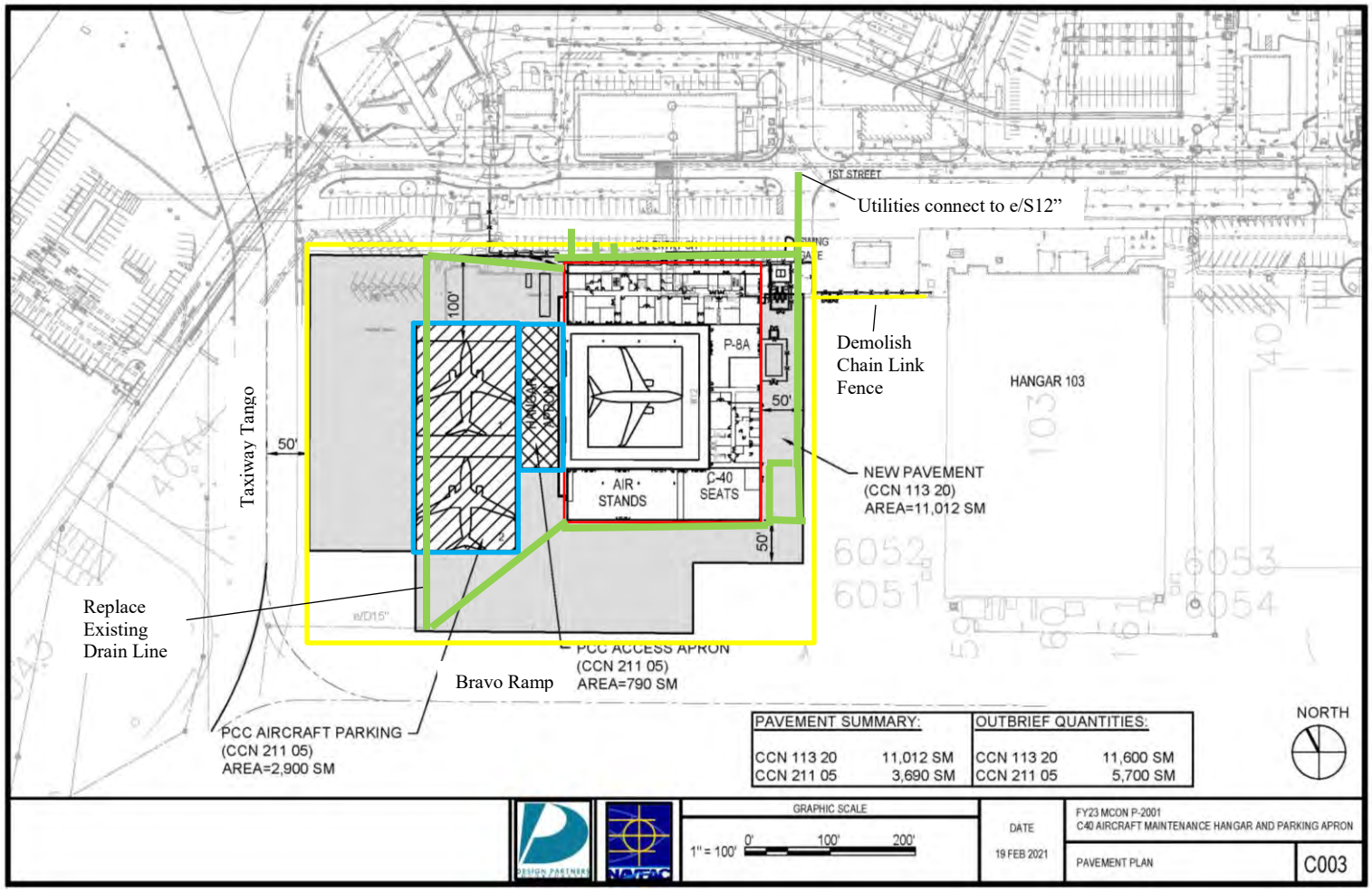
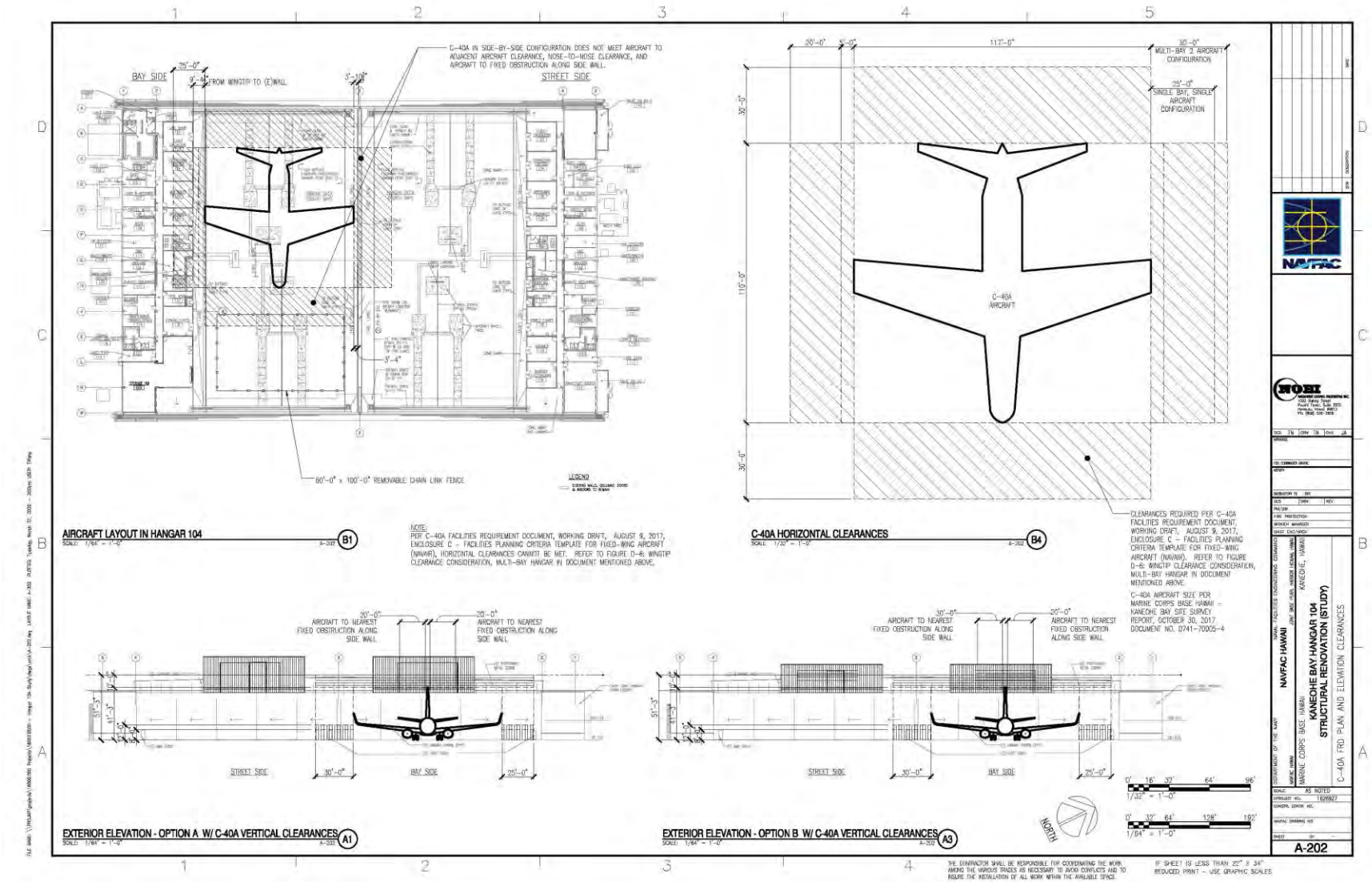
Enclosure 1. Map showing the general location and footprint of the C-40 Aircraft Maintenance Hangar and Parking Apron project in the southwest portion of Mokapu Peninsula (outlined in red).



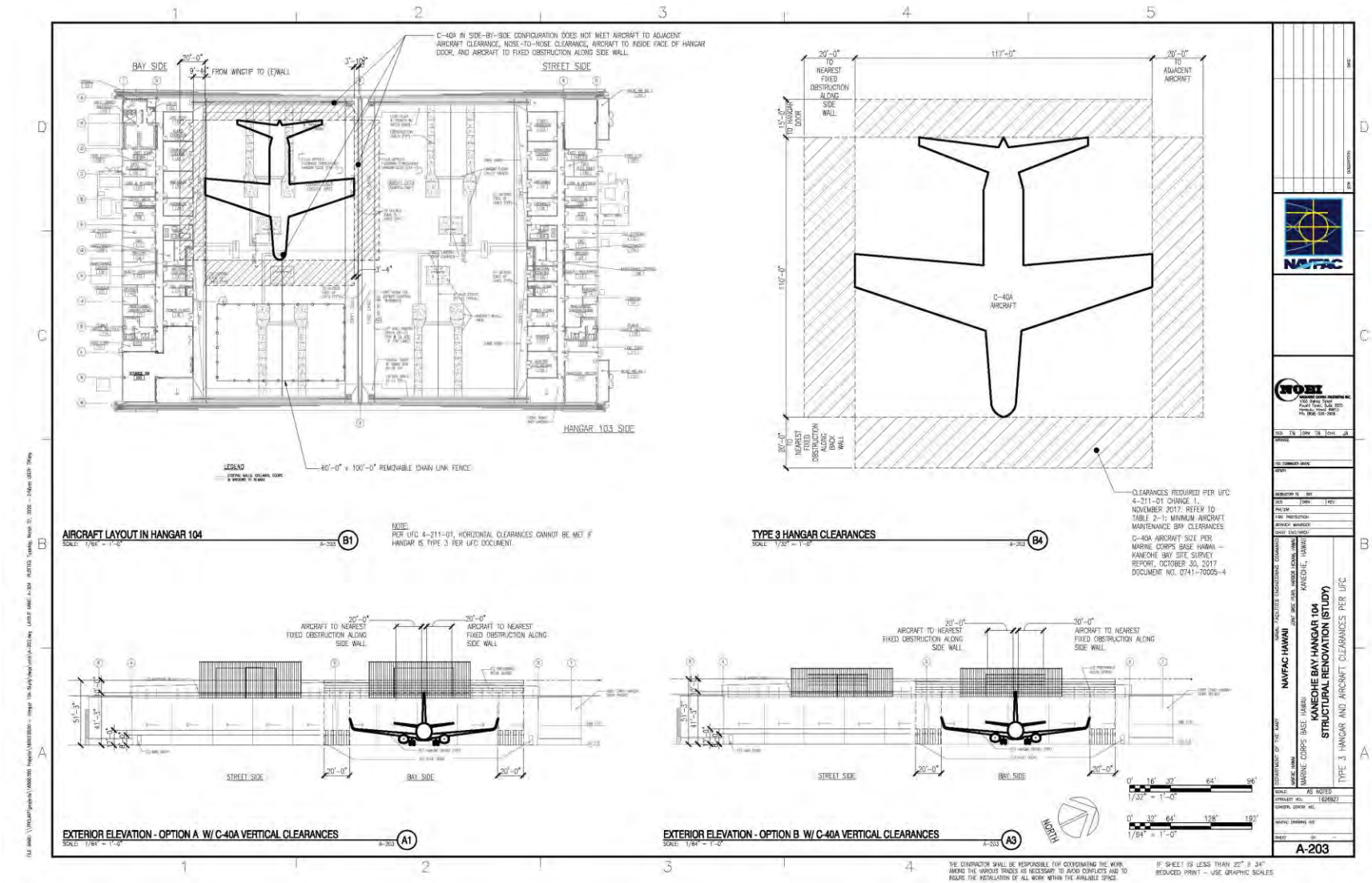
Enclosure 2. Plan drawing showing the proposed project footprint, bounded by 1st Street on the north, Hangar 3 on the east, Bravo Ramp on the south, Taxiway Tango on the west. Note: Yellow outline indicates limits of demolition including existing Hangar 4, Bldg 4048, fencing, and pavement. Red outline indicates footprint of new hangar which requires pilings extending approximately 16 feet deep. Blue outline indicates the aircraft parking area and hangar access apron constructed of PCC extending approximately 8 feet deep. Gray area indicates new asphalt pavement extending approximately 10 inches deep. Green indicates the utilities trenching extending approximately 10 feet deep (based on C-004).

Note: Depicted aircraft are to show parking options only



Enclosure 3. Drawing A-202 showing that modifications to Hangar 4 would not be able to achieve the required horizontal clearance for the C-40s aircraft in the hangar.

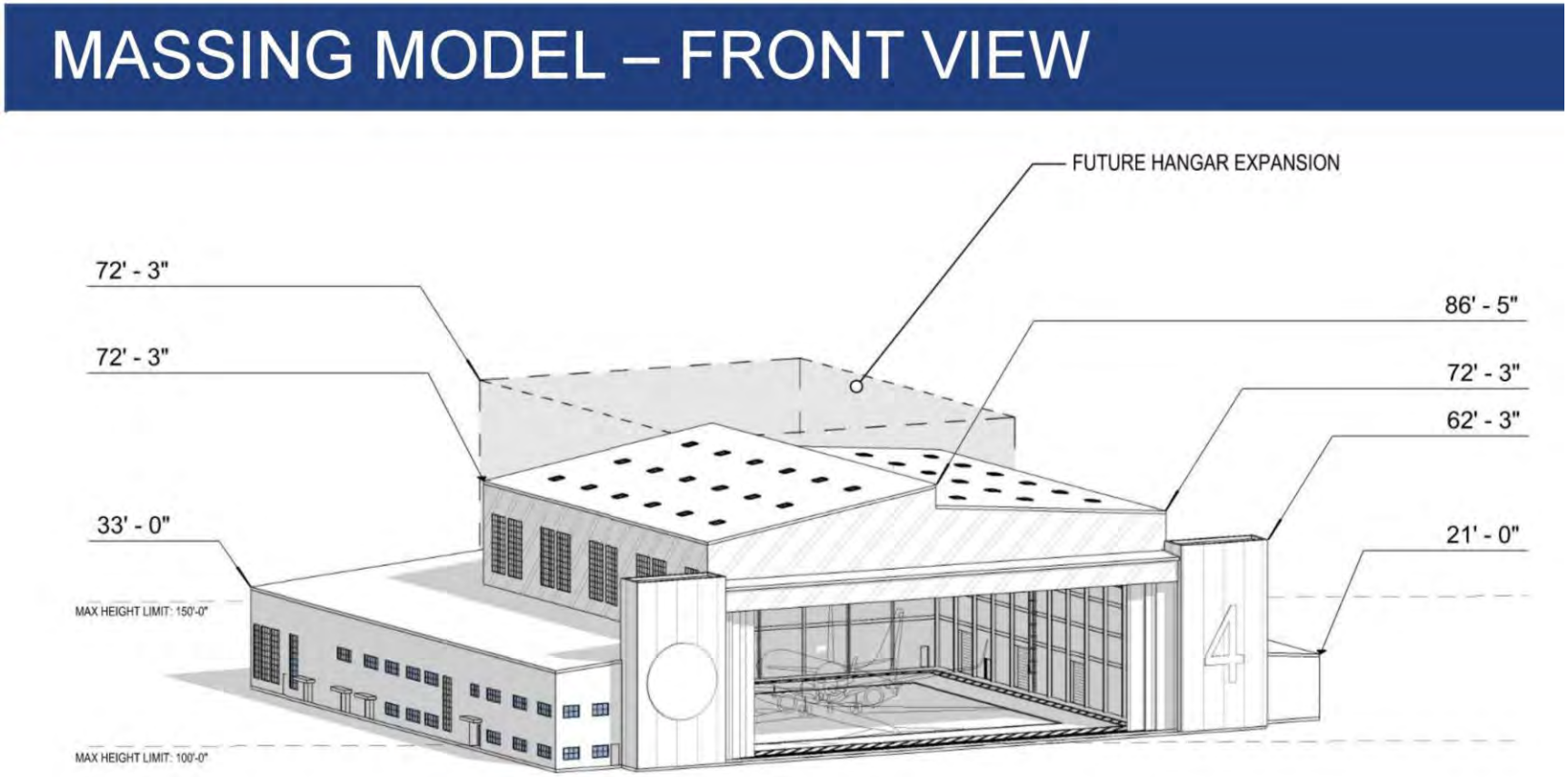
5090
LFE/204-21



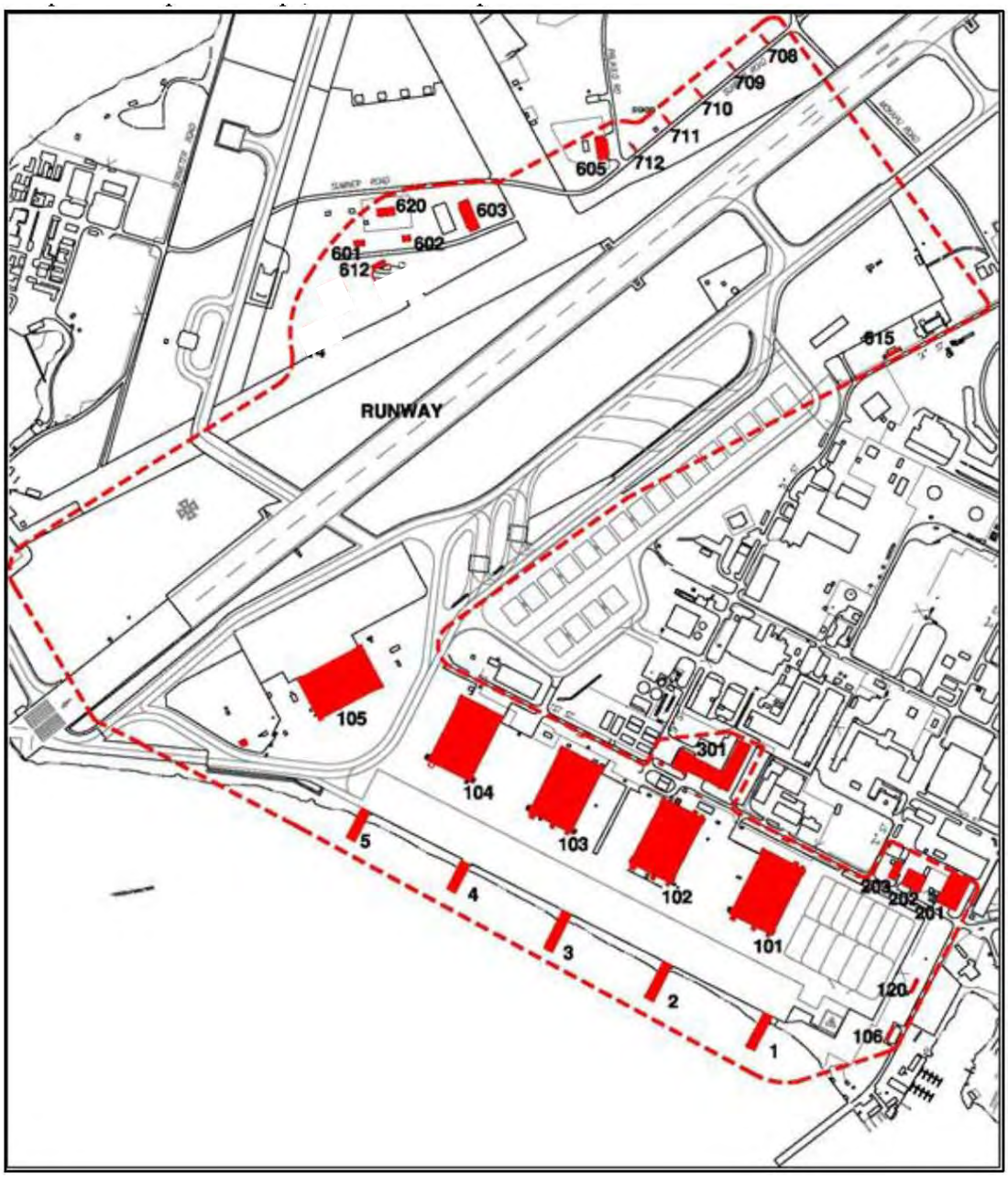
Enclosure 4. Drawing A-203 showing that modifications to Hangar 4 to meet vertical clearance requirements

would significantly alter the appearance of the hangar but nonetheless fail to meet horizontal clearance requirements.

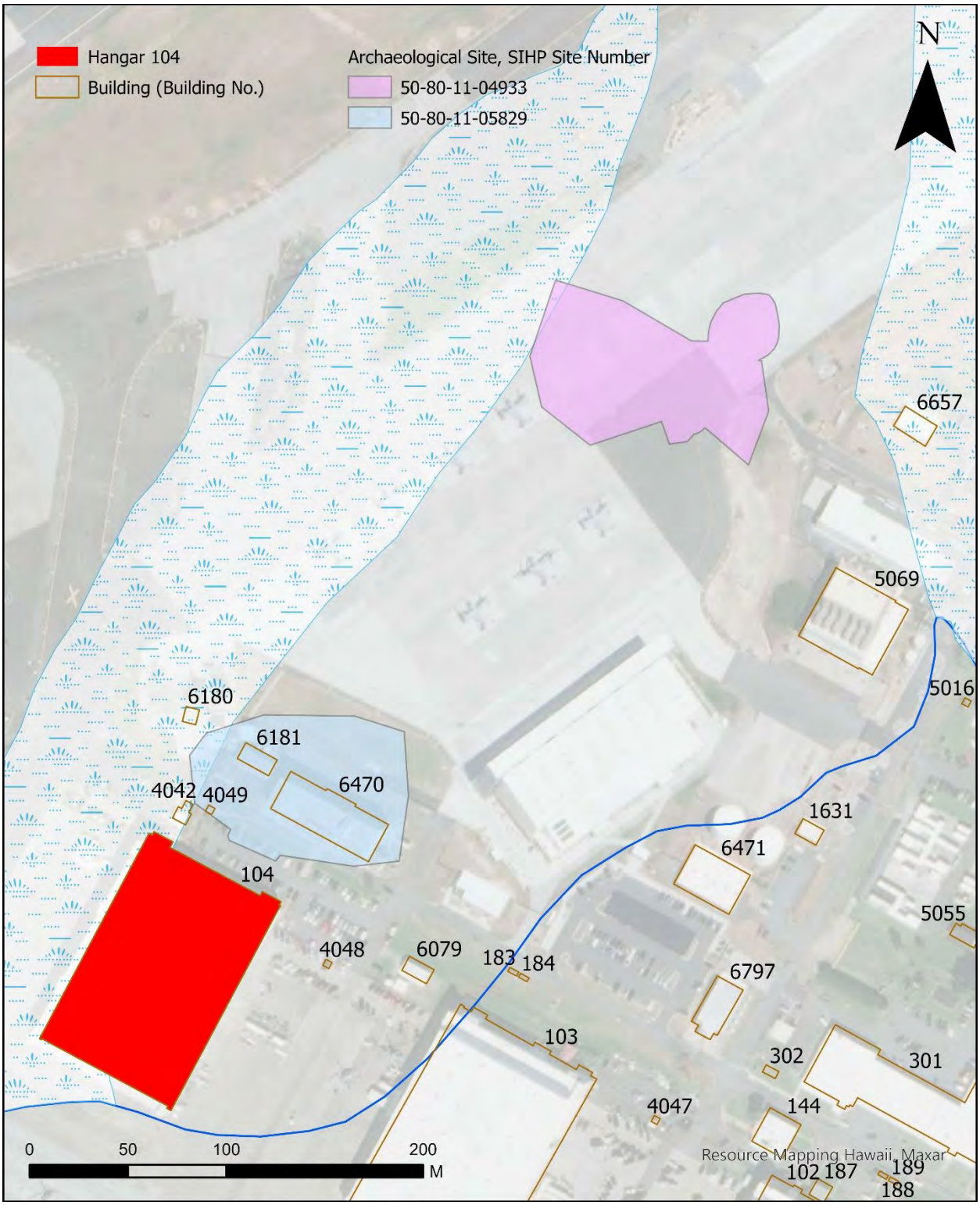
Enclosure 5. Rendering of the front view of the proposed Navy hangar.



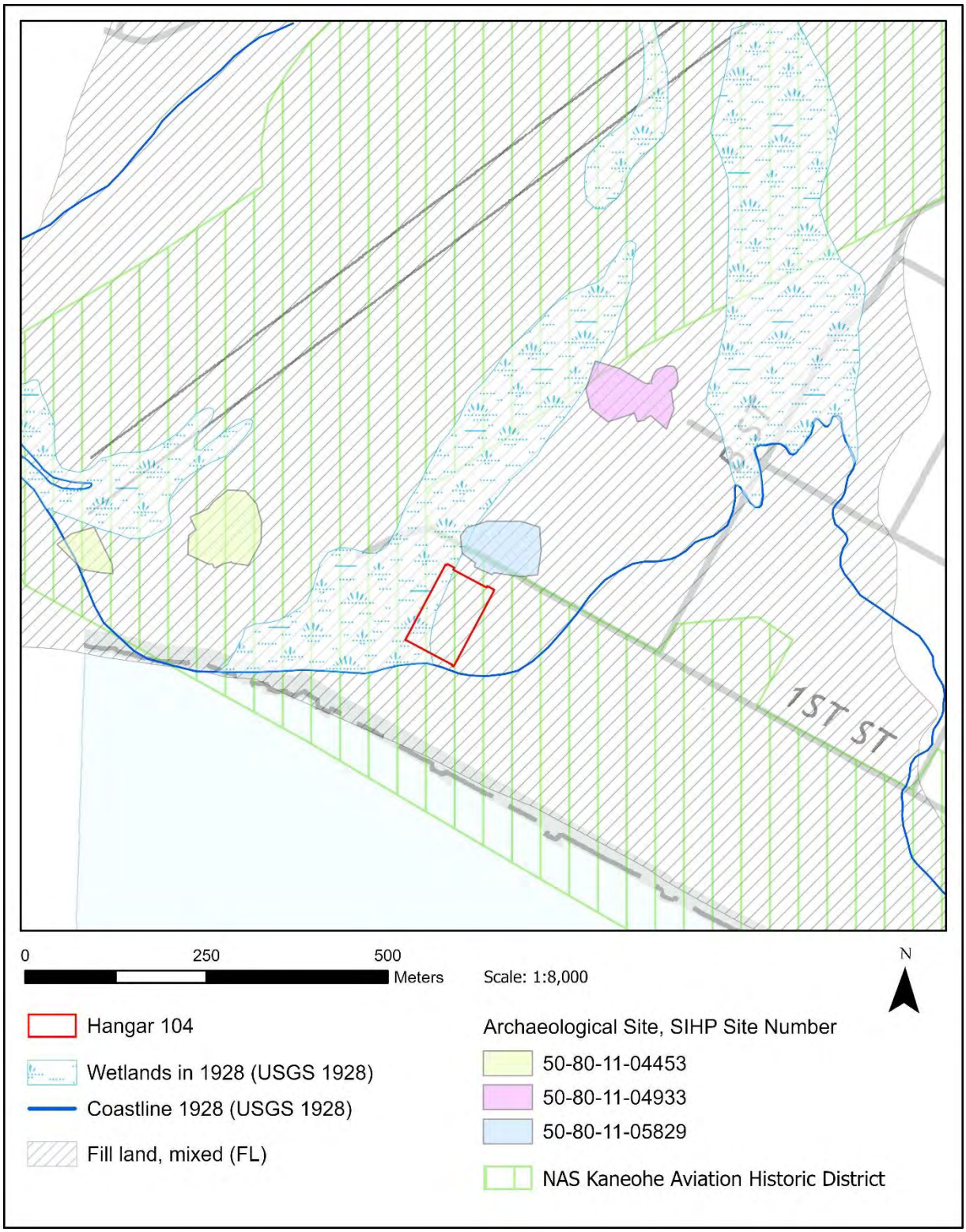
Enclosure 6. Massing of the front view of the proposed Navy hangar.



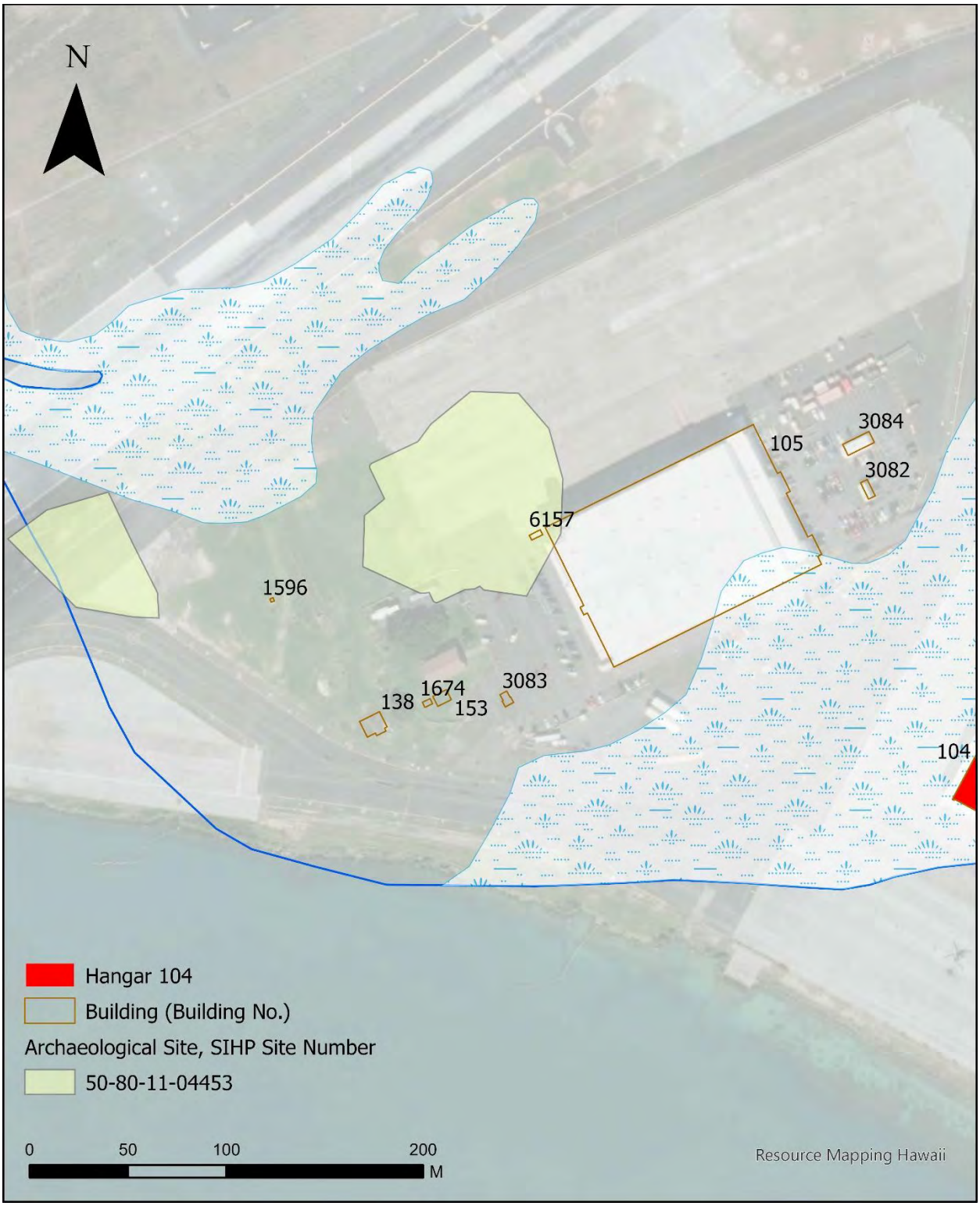
Enclosure 7. The Area of Potential Effect (APE) for the C-40 Aircraft Maintenance Hangar and Parking Apron project includes the project footprint at Hangar 4 and the surrounding NAS Kaneohe Aviation Historic District (dashed red line). Within the historic district is the Kaneohe Naval Air Station National Historic Landmark (NHL) district, consisting of Hangar 1, seaplane ramps 1-5, and Bravo Ramp. Note: on the west side of the runway, contributing elements to the NAS Kaneohe Aviation Historic District - 601, 612, 620, 602, 603, 605 - are slated for demolition under the Airfield Improvements and Demolition MOA (2017). Contributing facility 301 is slated for demolition under the PA MV-22 Basing in Hawai`i (2012).



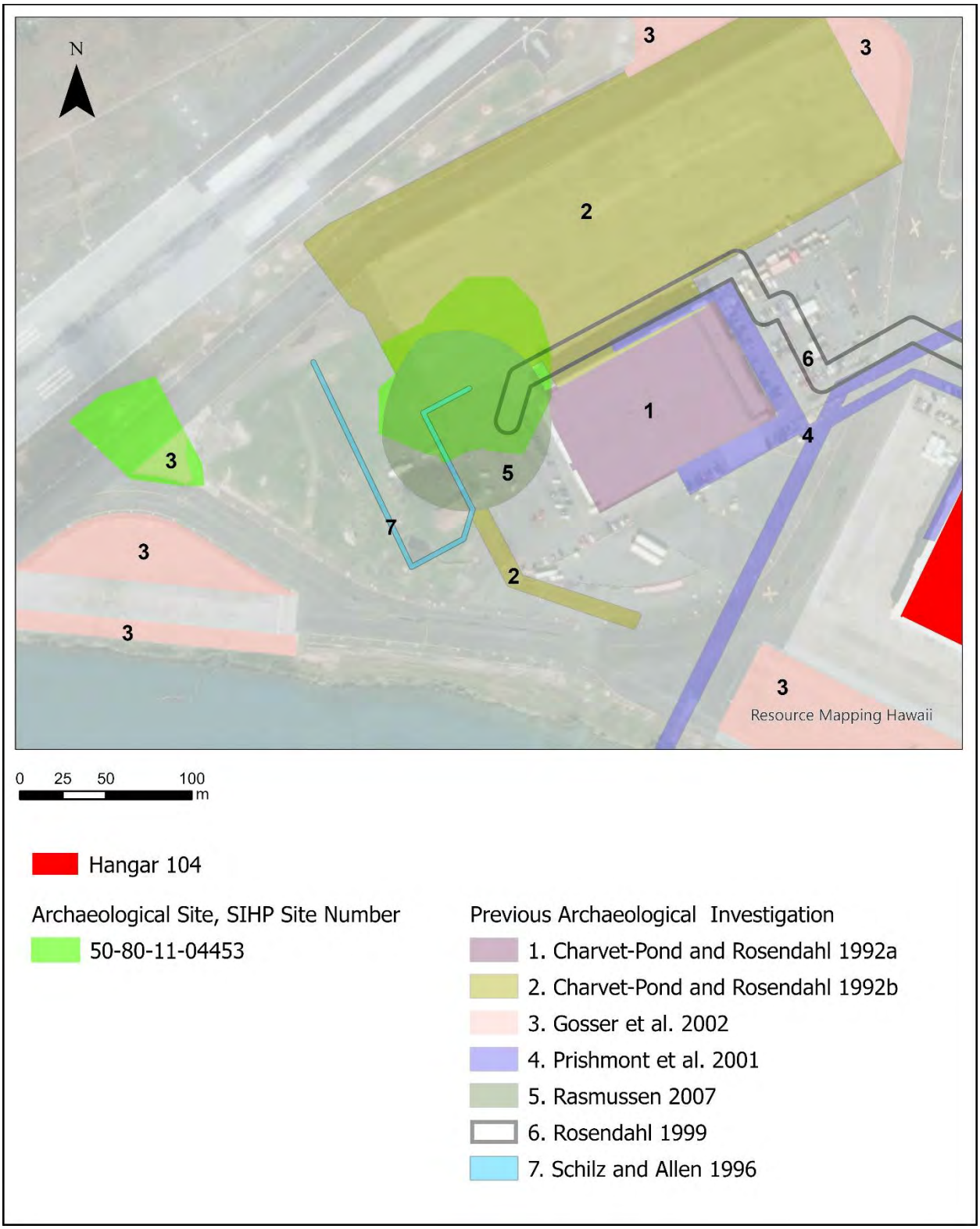
Enclosure 8. *Distribution of Exiting Buildings, former wetlands, and Site 4933 and Site 5829.*



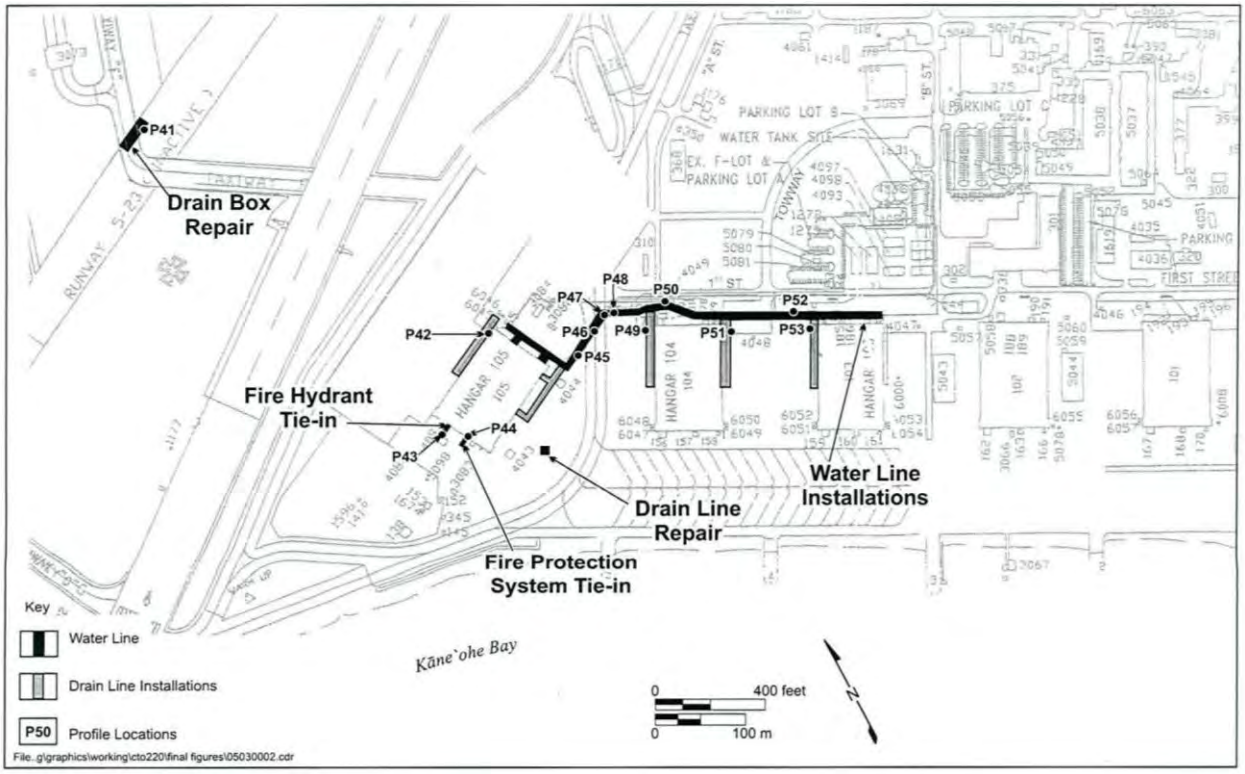
Enclosure 9. *Distribution of Previously Identified Archaeological Sites Near Hangar 104 in Relation to the Historic Shoreline and Fill Land.*



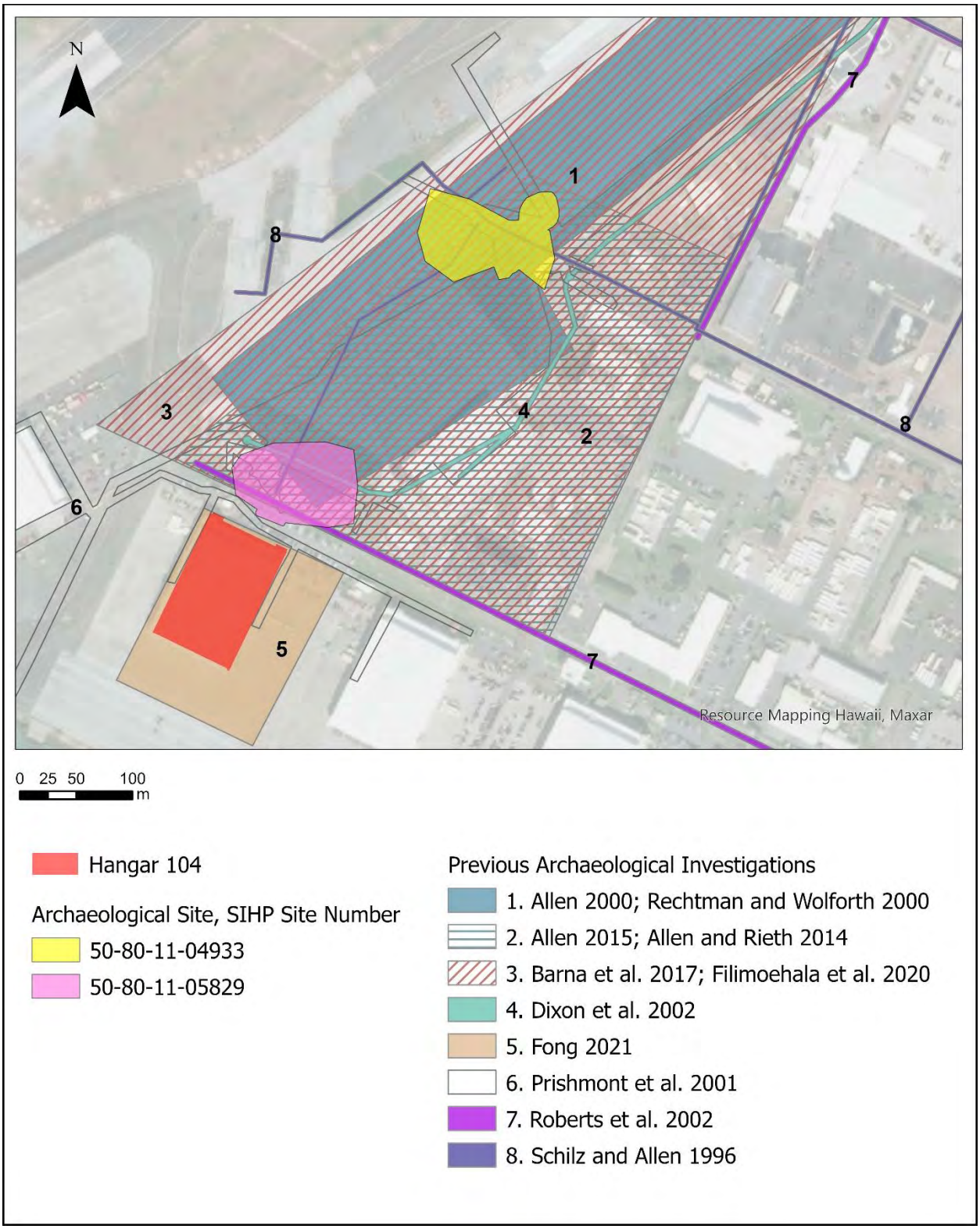
Enclosure 10. *Distribution of Existing Buildings, Former Wetlands, 1928 Shoreline, and Site 4453.*



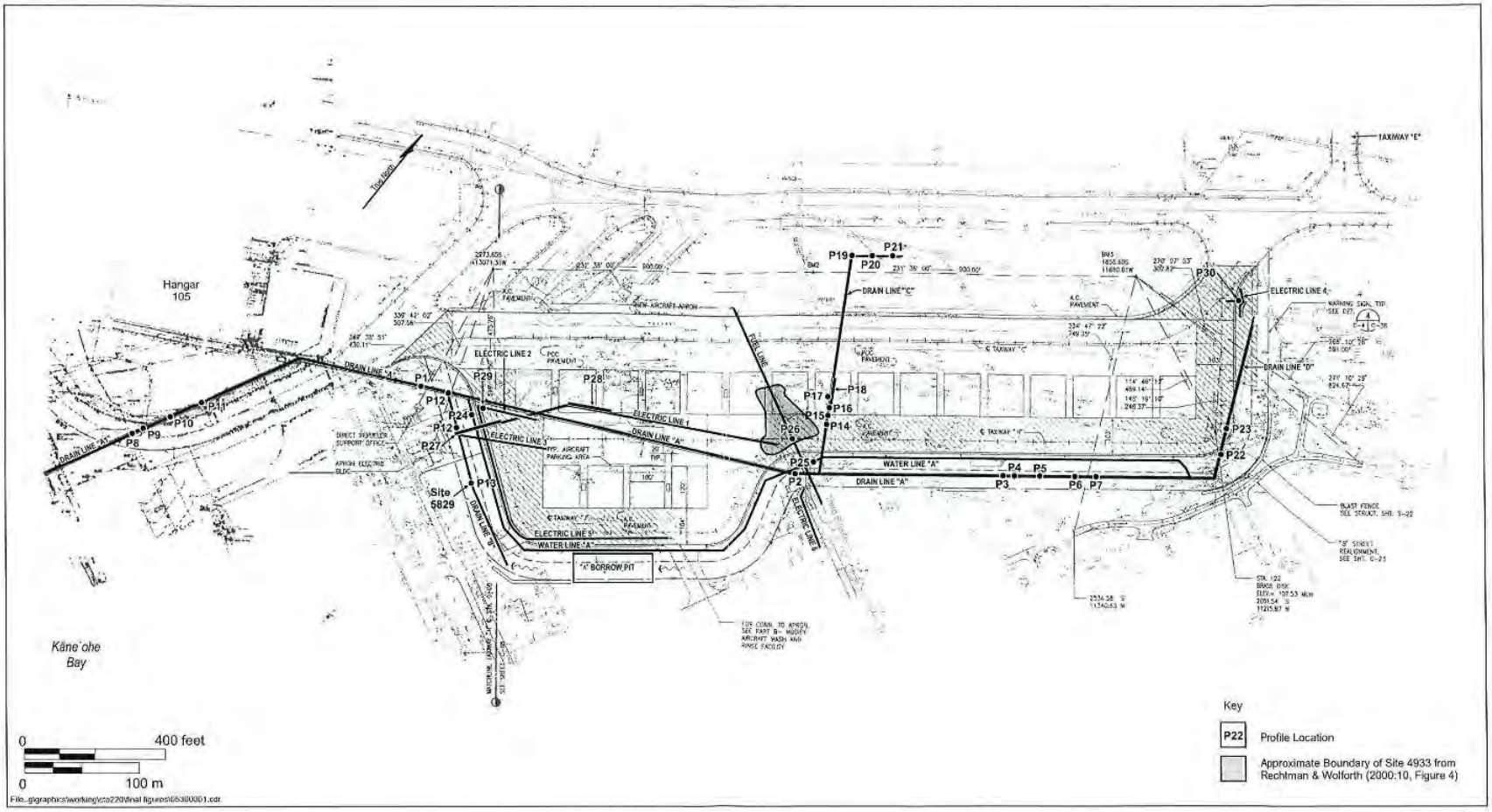
Enclosure 11. *Previous Archaeological Investigation Near Site 4453.*



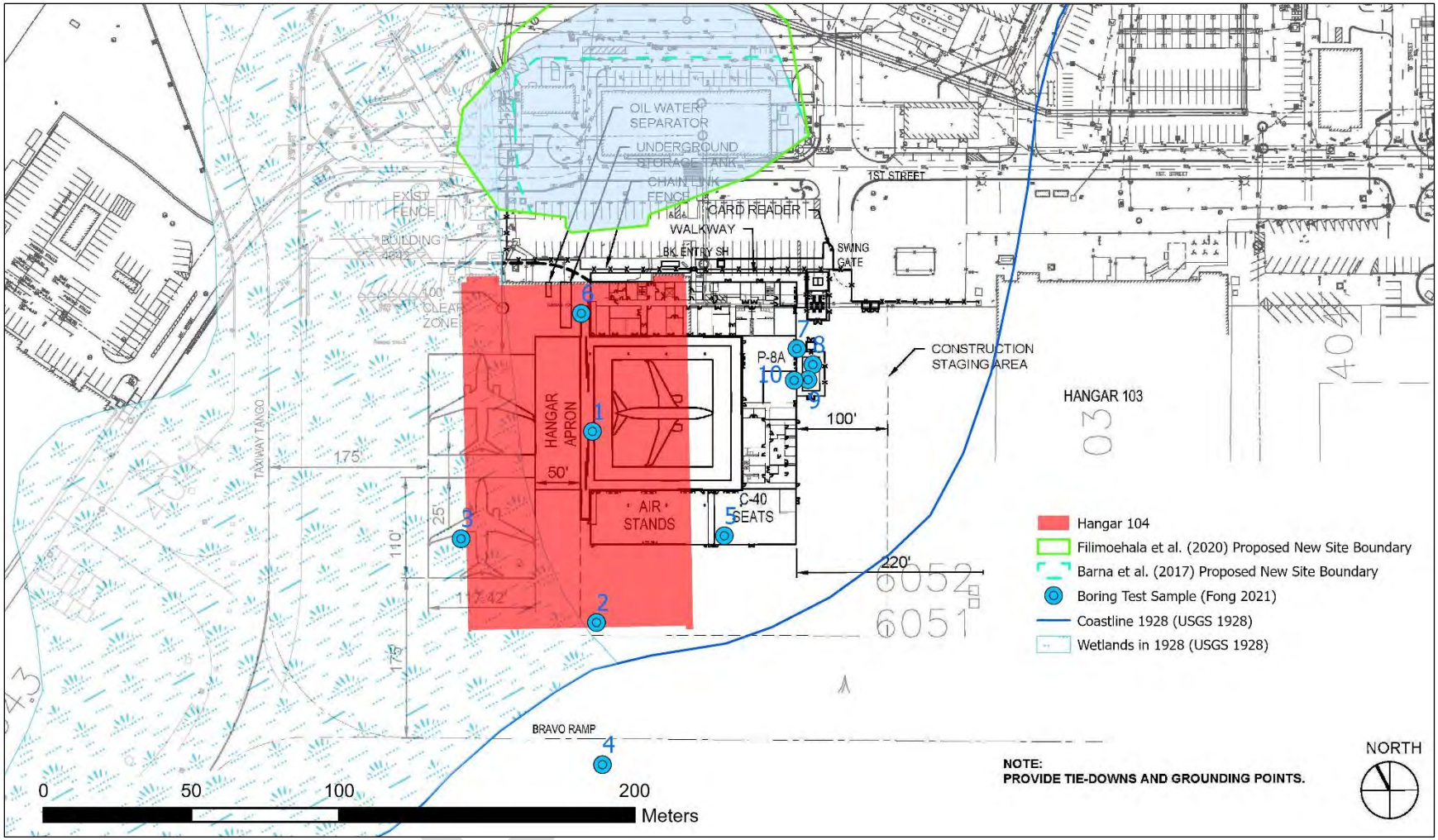
Enclosure 12. *Soil Profiles Recorded By Prishmont et al. (2001: Figure 11) Under Task Order 5.*



Enclosure 13. *Previous Archaeological Investigation Near Site 4933 and Site 5829.*

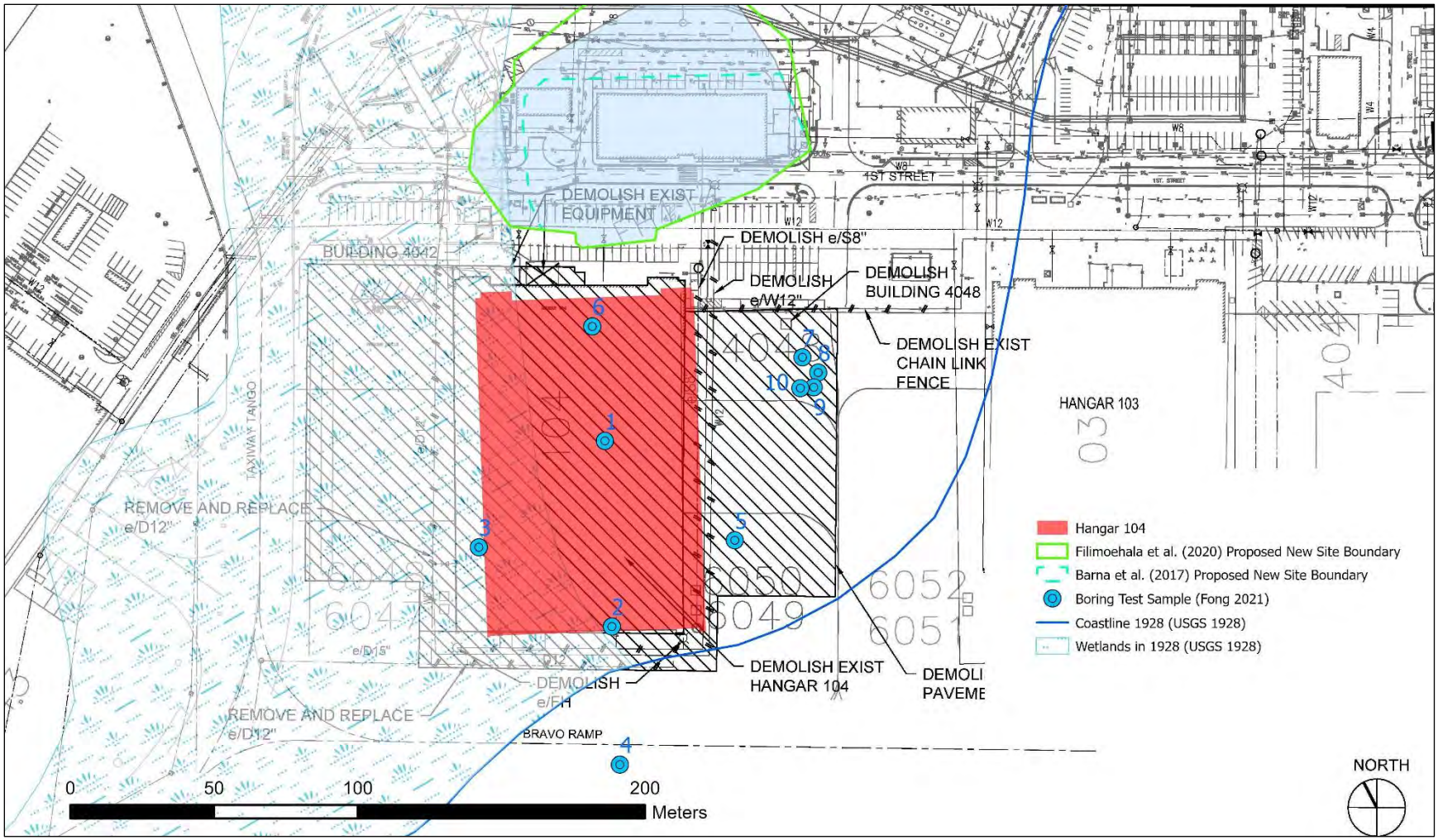


Enclosure 14. *Soil Profiles Recorded By Prishmont et al. (2001: Figure 11) Under Task Order 1.*

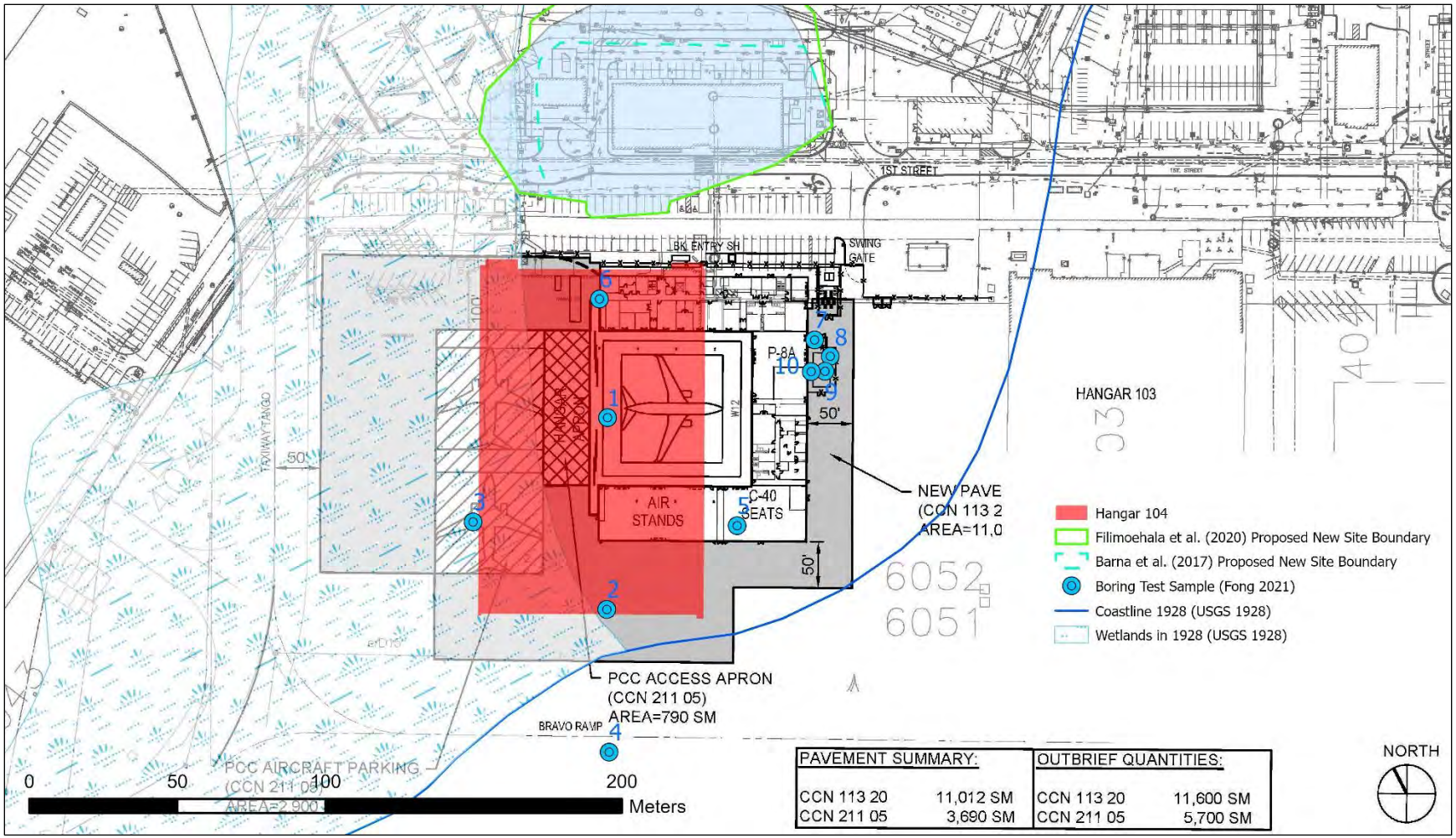


Enclosure 15. Modified Site Plan.

Note: Depicted aircraft are to show parking options only

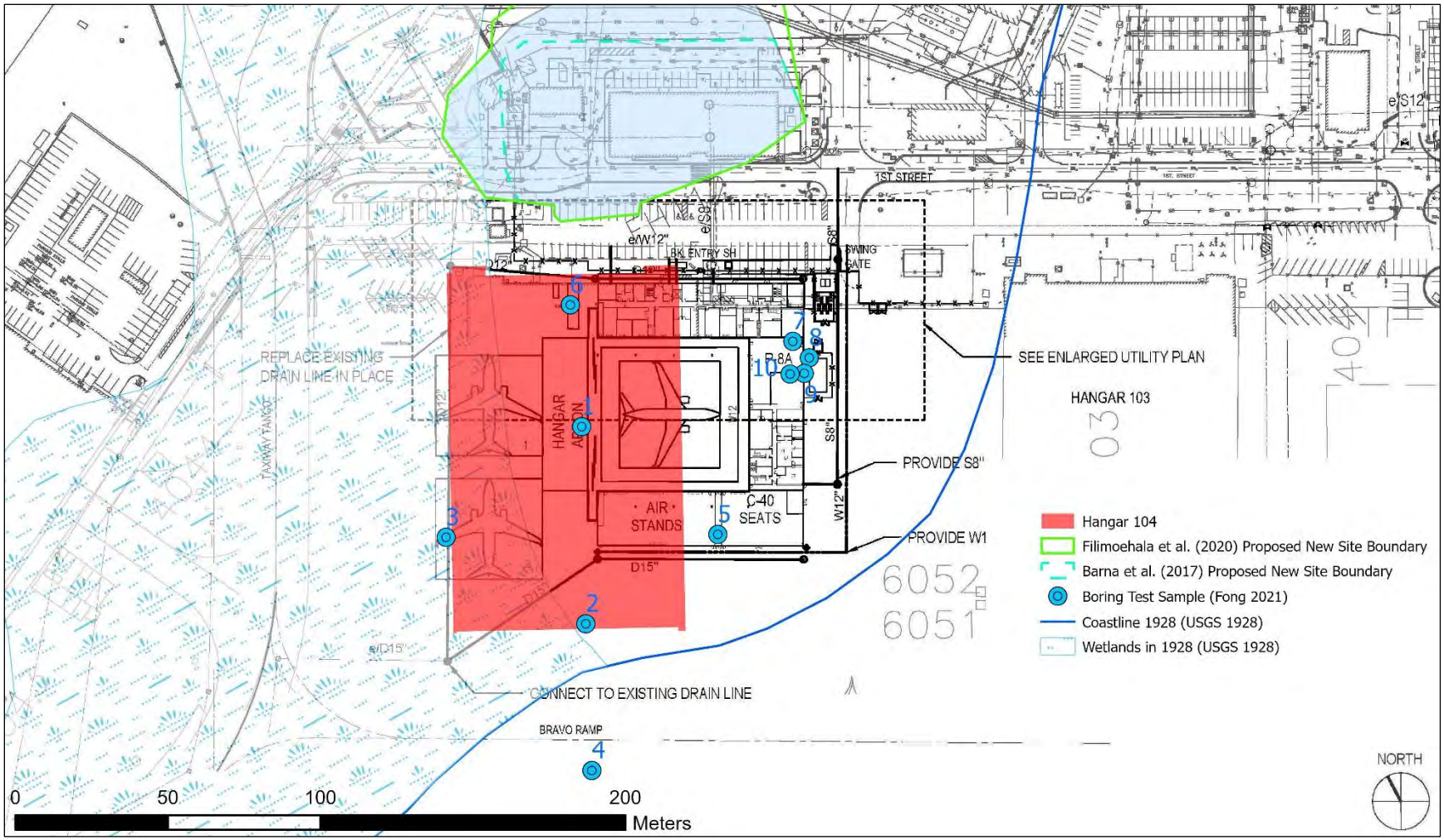


Enclosure 16. Modified Demolition Plan.



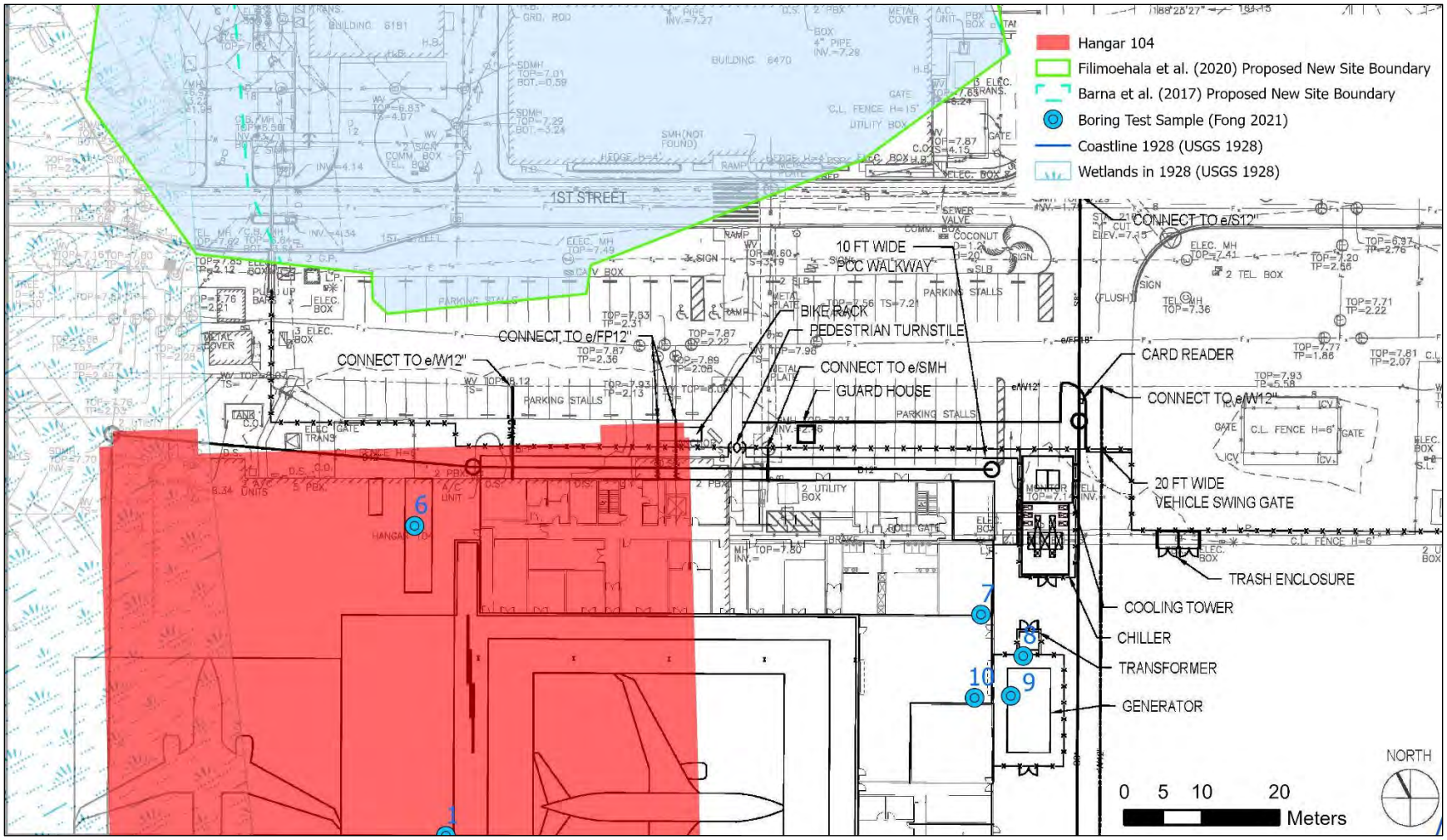
Enclosure 17. Modified Pavement Plan.

Note: Depicted aircraft are to show parking options only

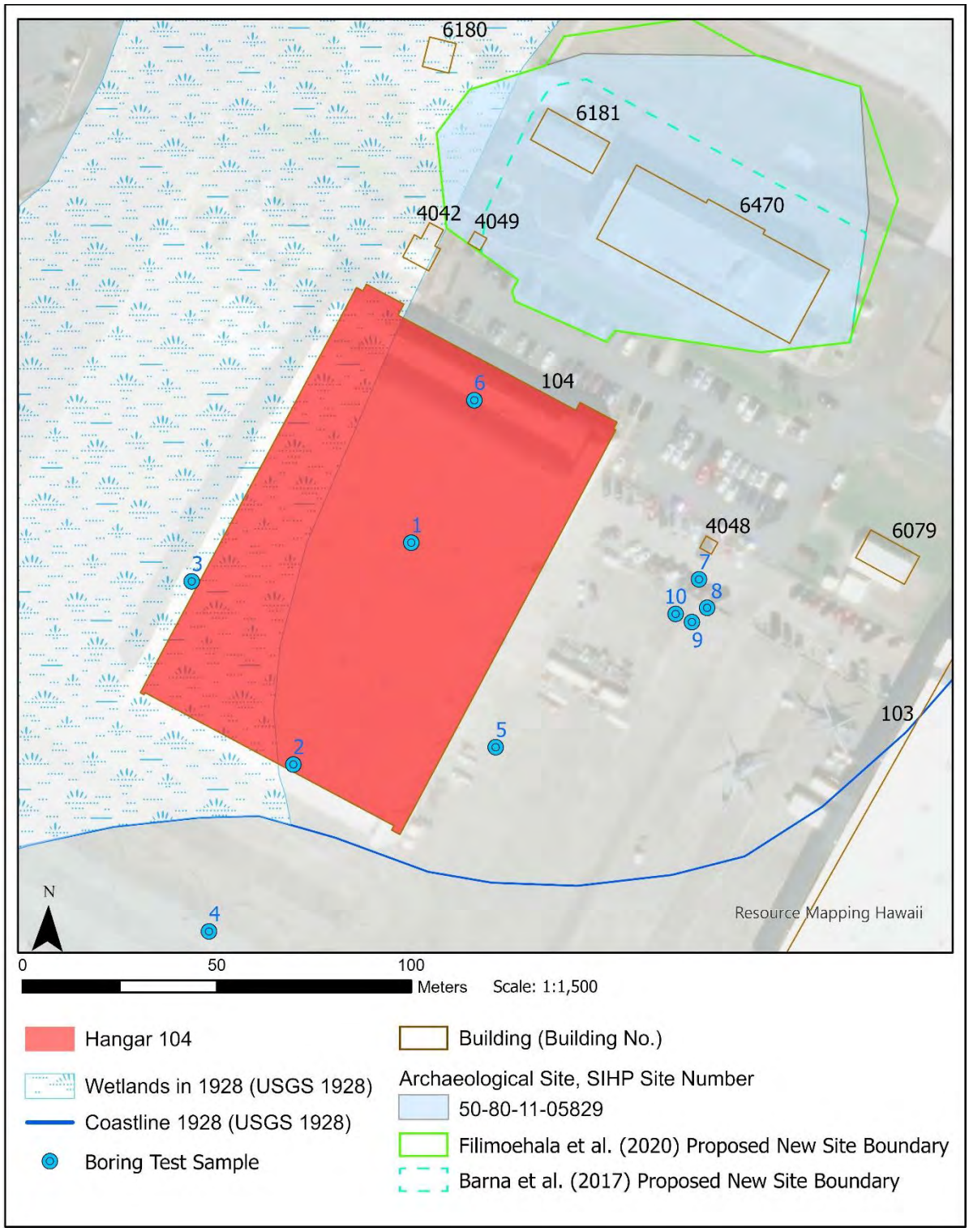


Enclosure 18. Modified Utility Plan.

Note: Depicted aircraft are to show parking options only



Enclosure 19. Modified Close-Up of Utility Plan.



Enclosure 20. *Locations of Boring Test Samples Documented in Fong (2021).*

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

December 27, 2021

IN REPLY REFER TO:
Project No.: 2021PR01494
Doc. No.: 2112SH18
Archaeology
Architecture

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

Dear Major J. P. Hart:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review –
Initiation of Consultation Request for Concurrence with the Effect Determination
MILCON P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron Aboard
Marine Corps Base Hawai‘i
Ref. No. 5090 LFE/204-21
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 November 21, 2021 from the Marine Corps Base Hawai‘i (MCBH) to initiate Section 106 consultation and request the State Historic Preservation Officer’s (SHPO’s) concurrence with the effect determination for the MILCON P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron project at MCBH on the island of O‘ahu. The SHPD received this submittal on November 29, 2021. MCBH held a meeting with SHPD and additional consulting parties on December 9, 2021 to introduce the project.

MCBH’s letter states that the C-40 Aircraft Maintenance Hangar and Parking Apron project is located in the southwest portion of Mokapu Peninsula. The project area is centered around Hangar 4 (Building 104), bounded by 1st Street on the north, Hangar 3 (Facility 103) on the east, Bravo Ramp on the south, and Taxiway Tango on the west. The project involves the construction of a new C-40 aircraft maintenance hangar and parking apron for the Navy’s Fleet Logistics Support Squadron Five One (VR-51). VR-51 is a tenant command that currently operates aircraft out of Hangars 4 and Hangar 5 (Building 105) at MCBH. In 2019, the VR-51 squadron transitioned from two C-20G aircraft to two C-40 aircraft, which Hangars 4 and 5 are unable to accommodate. The C-40s are a larger aircraft, and these existing hangars are too small for both their wingspan and tail height. There are no existing hangars available at MCBH that can adequately accommodate C-40 aircraft requirements.

The Navy proposes to replace the existing historic Hangar 4 with a new larger Type III maintenance hangar and parking apron for the VR-51’s C-40 aircraft, demolish Buildings 4048 and 4042, install pedestrian sidewalks, and upgrade the electrical, fire, mechanical, and plumbing systems. The new hangar will have a steel-frame construction with standing seam metal roofing, concrete filled metal deck floors, and a pile foundation. Hangar 5 will be used as swing space for VR-51 during the construction phase of P-2001. The proposed scope of work will include: (1) demolition of Hangar 4, (2) replacement of existing apron pavement around Hangar 4, (3) demolition of Building 4048 (gate/sentry house) and Building 4042 (generator building), (4) construction of a Type III high-bay aircraft maintenance hangar with low-rise space for administration, maintenance and aircraft/spares storage, (5) installation of pedestrian sidewalks, and (6) upgrades to associated utilities. In addition to providing a weather protected shelter

for inspection, service, and maintenance of the C-40 aircraft, the project also provides maintenance and storage space for a P-8A Detachment currently located at MCBH.

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 MCBH has determined the area of potential effects (APE) to include the footprint of the P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron project and the surrounding Naval Air Station (NAS) Kaneohe Aviation Historic District. The MCBH notes, a significant component part, and individually listed district within the Aviation District, is the Kāneʻohe Naval Air Station National Historic Landmark District (NHL).

Hangar 4 (Building 104) was constructed between 1941-1942 and is one of five aircraft maintenance and storage buildings at MCBH. It is a contributing resource to the Naval Air Station Kāneʻohe Aviation District which is listed in the National Register of Historic Places (NRHP). It is assigned NRHP #87001299 and State Inventory of Historic Places (SIHP) #50-80-11-1386. MCBH states the district and its architectural resources have been determined to be eligible for the National Register of Historic Places under Criteria A and C. Hangar 4 sits adjacent to the NHL and is approximately 530m to the east of Hangar 1, the main component of the Kāneʻohe Naval Air Station National Historic Landmark District. Hangar 4 was documented in a 1997 Historic American Buildings Survey (HABS HI-311A) with an addendum written in 2019.

Buildings 4048 (gate/sentry house) and 4042 (generator building) slated for demolition, were both constructed in 1987. MCBH states that neither are eligible for the NRHP or are contributing resources to the two historic districts.

Three traditional Hawaiian archaeological sites (SIHP #50-80-11-04453, 50-80-11-04933, and 50-80-11-05829) have been identified in the vicinity of the APE. MCBH states these sites are eligible for listing on the NRHP and are not likely to be affected by the proposed undertaking. MCBH states several previous archaeological investigations identified the boundaries of SIHP #50-80-11-04453 subsurface cultural deposit (Allen 2015; Charvet-Pond and Rosendahl 1992a, 1992b; Gosser et al. 2002; Prishmont et al. 2001; Rasmussen 2007; Rosendahl 1999) and that planned ground disturbance is outside the known boundaries of this site. Further data are needed to determine the boundaries of SIHP #50-80-11-04933, but MCBH states the area of proposed ground disturbance will be located approximately 280 m to the south of the known cultural deposits associated with this site. SIHP #50-80-11-05829 is located approximately 15.0 m northeast of Hangar 4. It appears from Enclosure 13 that there has been no archaeological investigation between the boundaries designated for SIHP #50-80-11-05829 and the footprint of Hangar 4.

The SHPO concurs these sites are significant per Criterion D of the NRHP, but opines the data provided by these sites may be representative of a cultural landscape or traditional cultural property, rather than three distinct sites and thus additional archaeological investigation of these sites' temporal and spatial context is needed.

The MCBH states subsurface testing consisting of test trenching/units has been recommended for any future work in the area and MCBH is proposing to conduct archaeological monitoring designed to do data recovery for all ground disturbing activities associated with this undertaking. The SHPD requests efforts to identify subsurface archaeological deposits in areas not yet tested by a qualified archaeologist, but which will undergo ground disturbance associated with the undertaking, are conducted prior to the start of the project. The SHPD agrees archaeological monitoring is needed during the project. However, consultation with native Hawaiian Organizations is needed regarding the possible impacts to archaeological sites and cultural resources prior to any final decisions which may impact archaeological resources.

The MCBH has determined the proposed project will result in an *adverse effect*. The SHPO agrees the demolition of a NRHP eligible historic property will result in an adverse effect to the resource. However, prior to concurrence with the effect determination, additional consultation per the Section 106 process is needed to take into account views provided by the public and consulting parties.

The subject letter states MCBH will make this information available to the public so the members of the public will have an opportunity to express their views on resolving adverse effects of the undertaking and that MCBH will be consulting with the SHPO and the consulting parties listed in their letter to develop and evaluate alternatives or

modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties. **The SHPO requests** the results of these consultation efforts.

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,
Susan A. Lebo
Signed For
Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Christopher Frantz, MCBH (christopher.frantz@usmc.mil)
June Cleghorn, MCBH (june.cleghorn@usmc.mil)
Wendy Wichman, MCBH (wendy.wichman@usmc.mil)

HISTORIC HAWAIʻI FOUNDATION

680 Iwilei Road Suite 690, Honolulu HI 96817 • (808) 523-2900 • preservation@historichawaii.org • www.historichawaii.org

February 13, 2022

J.P. Hart
Major, U.S. Marine Corps
Director, Environmental Compliance and Protection Division
Marine Corps Base Hawaiʻi
Box 63002
Kāneʻohe Bay, HI 96863-3002

Via email to jeffry.hart@usmc.mil

RE: NHPA Section 106 Consultation (Architecture & Archaeology)
MILCON P-2001
C-40 Aircraft Maintenance Hangar & Parking Apron
Aboard Marine Corps Base Hawaiʻi
District of Koʻolaupoko, ʻAhupuaʻa of Heʻeia, Island of Oʻahu
TMK 1-4-4-008:001

Dear Major Hart:

Historic Hawaiʻi Foundation (HHF) is responding to continuing consultation with Marine Corps Base Hawaiʻi (MCBH) and U.S. Naval Air Force Reserve (Navy) to implement Military Construction Project (MILCON) P-2001 C-40 Aircraft Maintenance Hangar & Parking Apron at the Kāneʻohe Bay installation. MCBH initiated National Historic Preservation Act (NHPA) Section 106 consultation in November 2021.

HHF accepted the invitation to participate as a consulting party and attended consultation meetings on December 9, 2021 and February 10, 2022. Consultation meetings are scheduled to continue on an alternate monthly schedule to address the concerns.

Project Description

The project proposes to construct a new C-40 aircraft maintenance hangar and parking apron for the Navy's Fleet Logistics Support Squadron Five One (VR-51). VR-51 is a tenant command that currently operates aircraft out of Hangars 4 and 5 at MCBH. In 2019, the VR-51 squadron transitioned from two C-20G aircraft to two C-40 aircraft, which Hangars 4 and 5 are unable to accommodate. MCBH stated that the C-40s are a larger aircraft, and these existing hangars are too small for both their wingspan and tail height.

There are no existing hangars available at MCBH that can adequately accommodate C-40 aircraft requirements. Currently, the C-40 aircraft are parked in the open on the Hangar 5 apron where inclement weather poses multiple risks if they are in non-flyable status during such an event.

In 2020, the Navy carried out an Engineering Study to determine the feasibility of altering Hangar 4 to accommodate two (2) C-40 aircraft. After applying the horizontal and vertical clearances from facilities guidelines, the study concluded that modifications could not achieve the required horizontal clearances for the main wing or the vertical clearances for the plane's tail. Based on this conclusion, the Navy decided to provide maintenance and support spaces for the VR-51's C-40 aircraft with a new Type III hangar. To clear space for the new hangar, Navy proposes to demolish historic Hangar 4.

Determination of Effect

MCBH determined the proposed undertaking will result in an adverse effect on historic properties in accordance with Section 106 implementing regulations at 36 CFR 800.5(a)(1) based on demolition of Hangar 4, which is eligible for the National Register of Historic Places as a contributing element of the NAS Kaneohe Aviation Historic District.

HHF agrees that the proposed project would have an adverse effect on Hangar 4 and the NAS Kaneohe Aviation Historic District.

MCBH determined that the proposed undertaking is outside the boundary of the adjacent National Historic Landmark and will not have an adverse effect on the NHL. **HHF does not yet agree with the determination of effect for the NHL; we are withholding concurrence until more information is known**.

MCBH summarized the results of previous archaeological studies and determined that the proposed undertaking will result in no adverse effects to sites 04453, 04933, or 05829. MCBH stated that previous archaeological investigations in the immediate vicinity of the area of proposed ground disturbance found no conclusive evidence of cultural deposits associated with the three sites, which are located to the west and north of Hangar 104 and outside the current project area.

Native Hawaiian Organization who are participating in the consultation have voiced strong concerns with MCBH's finding on the potential effect on cultural resources. **HHF does not yet agree with the determination of effect on archaeological sites and we are withholding concurrence until more information is known.**

Alternatives Analysis

During the December 2021 consultation meeting, the consulting parties requested additional information on alternative locations and designs that could address the purpose and need in a manner that avoids or minimizes adverse effects on historic properties, including the building, the district and potentially on archaeological and cultural resources.

During the February 2022 consultation meeting, MCBH presented additional information about alternatives considered and results of the screening parameters that were applied to compare the results.

MCBH requested additional comments on the alternatives analysis and results. HHF offers the following comments.

1. **Please confirm that each of the alternatives uses the same assumptions about the number of aircraft to be accommodated**. The Section 106 initiation letter stated that the 2020 Engineering Study determined the "feasibility of altering Hangar 4 to accommodate two (2) C-40 aircraft." The existing hangar was deemed too small for modification and alteration to accommodate the aircraft.

   However, the presentation materials for the 2/10/22 consultation meeting shared a conceptual site plan for the proposed new Type III hangar (slide 10) that indicates that the new hangar would have interior space for one (1) C-40 aircraft and an exterior parking apron for two (2) aircraft.

   The description of the undertaking states that the VR-51 squadron transitioned from two C-20G aircraft to two C-40 aircraft. The VR-51 staff confirmed that the squadron has two (2) aircraft. Yet the conceptual site plan indicates plans for three (3) aircraft.

   We are concerned that the alternatives analysis may have used shifting assumptions on both the number of aircraft to be accommodated in total (two or three), as well as how many would be expected to be enclosed in the hangar (one or two).

   Since several of the alternatives were screened out based on either too small interior capacity (in the case of existing Hangar 4) or too small apron and maneuvering space (in the case of alternative sites), **we request confirmation that all alternatives were screened using the same assumptions and the comparisons are equivalent**.

   Furthermore, **we request information on whether modification of Hangar 4 would be feasible if it were constructed to house one aircraft on the interior instead of two; and if any of the alternative locations would be feasible if the number of aircraft on the parking apron were changed**. For example, would Hangar 4 modification work if only one aircraft is housed inside and two outside? Or would one of the alternative locations work if a new hangar housed two aircraft inside and one on the parking apron? Etc.

2. The alternatives analysis included four sites at Joint Base Pearl Harbor Hickam (JBPHH). Of these, JBPHH Site 1 was eliminated because it has insufficient space for the parking ramp and the site is earmarked for use by Air Force; JBPHH Site 3 has limited parking ramp space, is earmarked by Air Force and has prohibitive clean-up costs due to former landfill; and JBPHH Site 4 has adequate space for both the hangar and the parking ramp, but is earmarked for use by the Air Force. HHF agrees with the decision to eliminate these alternatives from consideration.

   However, JBPHH Site 2 was eliminated based on insufficient space for the parking ramp. **Please address the question above re the number of aircraft used in the analysis and if the**

calculations change with tradeoffs between numbers of bays interior to the new hangar vs number of parking spaces on the apron.

3. The alternatives analysis included a general statement about the use of Kalealoa Airport John Rogers Field (formerly NAS Barbers Point). This site was eliminated because it is no longer a military-controlled air base and is under the jurisdiction of Hawai'i Department of Transportation.

   While HHF agrees that the current jurisdictional issues would eliminate this location from consideration, Barbers Point is often mentioned as an alternative location for a new Marine Corps station as bases in Okinawa, Guam and Australia are shifting personnel. **This alternative should be kept as an option until and unless Marine Corps and/or Navy confirms that is has no plans to establish another base in this location.**

4. The alternatives analysis included consideration of four additional sites at Kāne'ohe Bay:

   - West Field included two separate sites. These were eliminated because they are in the vicinity of explosive arcs and wetlands. HHF agrees with the decision to eliminate these alternatives from consideration.

   - Pali Kilo would need to be set back from the runway centerline beyond the location of the existing buildings (which are nonconforming to the runway clear zones) and would require substantial excavation into Keawanui Hill, impacting archaeological and historic resources. HHF agrees with the decision to eliminate this alternative from consideration.

   - Green Field was eliminated due to the need to reroute Mōkapu Road and existing utilities, and the need to demolish and replace several facilities.

     HHF disagrees with the decision to eliminate this alternative. As discussed in the consultation meeting, the Green Field site meets the MCBH screening parameters, has roughly the same construction feasibility issues (such as demolishing and replacing facilities and utilities) and is much less impactful to historic properties and the historic district.

     Therefore, HHF requests that MCBH and Navy provide a conceptual site plan and assessment of the Green Field site as a potential alternative location for the undertaking.

Thank you for the opportunity to provide questions and comments. Historic Hawai'i Foundation looks forward to continuing consultation.

Very truly yours,

Kiersten Faulkner

Kiersten Faulkner
Executive Director

Copies via email:

- June Cleghorn, Wendy Wichman, Chris Frantz and Jacquelyn Bomar, MCBH
- Jeffrey Fong, NAVFAC HI
- Susan Lebo, Stephanie Hacker and Julia Flauaus, State Historic Preservation Division
- Elaine Jackson-Retondo, National Park Service
- Elizabeth Merritt, National Trust for Historic Preservation
- Native Hawaiian Organizations (see MCBH Email Distribution)

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002
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IN REPLY REFER TO
5090
LFE/038-23
March 1, 2023

Kiersten Faulkner
Executive Director
Historic Hawaii Foundation
680 Iwilei Road, Suite 690
Honolulu, HI 96817

Dear Ms. Faulkner:

SUBJECT: SECTION 106 CONTINUING CONSULTATION (Architecture & Archaeology): MILCON P-2001 C-40 Aircraft Maintenance Hangar & Parking Apron Aboard Marine Corps Base Hawaii, District Of Koʻolaupoko, Ahupuaʻa Of Heʻeia, On The Island Of Oʻahu, TMK 1-4-4-008:001.

Thank you for your letter dated 13 February 2022. This letter responds to your request for additional information regarding the subject proposed Undertaking, the alternatives considered, and the basis of their evaluation leading up to identification of the proposed Undertaking. During the intervening period since we received your letter, the Navy and Marine Corps teams have worked to ensure that information provided in this Section 106 consultation is consistent with the amended analysis currently being conducted for the forthcoming National Environmental Protection Act (NEPA) Environmental Assessment (EA).

The purpose of the proposed Undertaking is to provide adequate hangar space for the maintenance and protection of C-40A aircraft operated by the Naval Air Force Reserve (also known as Fleet Logistic Support Squadron 51 or VR-51). The VR-51 is a current tenant on Marine Corps Base Hawaii (MCBH). Routine line maintenance for VR-51 is currently performed on the ramp adjacent to Hangar 105 on MCBH. Unscheduled maintenance and calendar-based maintenance necessitating use of a hangar is performed at Joint Base Pearl Harbor Hickam (JBPHH) or VR-57 in San Diego CA, VR-61 in Whidbey Island WA, or VR-58 in Jacksonville FL subject to availability.

The proposed action is needed to ensure the VR-51 has adequate indoor space to conduct required inspection, service and maintenance of their C-40A aircraft and to provide shelter for aircraft during storm events. As these aircraft age, unscheduled repairs and maintenance will occur more often, exacerbating scheduling problems and leading to long periods where aircraft are unavailable for missions.

The Navy and Marine Corps considered modifying the existing Hangar 104 to elevate the roof and reconfigure the supporting structure to accommodate the wingspan of the aircraft. However, this option would not address the insufficient weight rating of the existing floor. Because the ‘renovation’ option would need to also include complete replacement of the

foundation, as well as support structure, the associated degree of demolition for such a project would leave little to none of the existing hangar in-tact. Therefore, the screening criteria focused on identifying locations for building a new hangar.

Site screening criteria for site alternatives included:

1. Located within the Airfield Area of MCBH, or other available DoD-controlled secure site on the Island of Oahu, in order to be consistent with the VR-51's current mission and would not require regular long-haul flights to conduct required maintenance;

2. Adequate land is available, compatible with aviation uses, and sufficiently sized and configured to safely accommodate a Type III hangar with an aircraft parking apron that facilitates the C-40A turning radius. Site compatibility was assessed using the following considerations:

a. Site does not interfere or conflict with airfield safety requirements (runway primary surface and transitional surfaces; minimizes runway vehicle crossings);

b. Site does not have other inherent safety risks, such as overlapping explosive safety quantity-distance arcs (ESQDs), located in a tsunami evacuation zone, or located in a high flood zone; and

c. Site is compatible with existing mission operations and approved base planning documents. The site would not conflict with the function of existing mission assets. The site would also not conflict with installation master plans, Integrated Natural Resource Management Plans, or mission-related base instructions.

3. Site has adequate runway length, pavement strength, configuration, security and secure communications systems to support C-40A aircraft operations.

Two action alternatives meet the screening criteria and are being carried forward for analysis: Hangar 104 replacement and Green Field Site. While the Green Field Site is considered a feasible alternative, the preferred under NEPA is the Hangar 104 site alternative. Accordingly, the present NHPA consultation addresses the effects and proposed resolution of adverse effects of Hangar 104 replacement.

The following table summarizes additional alternatives considered but eliminated from further evaluation because they did not fulfill the minimum objectives and screening criteria to achieve the purpose and need for the proposed action.

Name of Alternative	**Why not carried forward for detailed analysis**
West Field Site, MCBH (A largely undeveloped site	The site, largely composed of aging asphalt and sparse vegetation, would not provide adequate land outside of the runway clear zone and explosive safety distance arcs. It would also interfere with operation of the airfield's Compass Calibration Pad. These calibration pads must be located in

Name of Alternative	Why not carried forward for detailed analysis
north of the runway, east of Taxiway F and adjacent to Sumner road)	magnetically quiet zones free of any magnetic influences, which include large structure with metal siding and roofs (DoD, 2019). The West Field Site does not meet all screening criteria.
Perimeter Road Site, MCBH (A largely cleared 3.2 acre site designated as a contractor lay-down area to the east of Perimeter Road and south of Sumner Road.)	Use of this site would require rerouting Perimeter Road and extensive construction of airfield pavements. The location would increase worker vehicle trips across an active airfield which poses a safety hazard. The site would also lie between two active helicopter and fixed wing flight paths (a high accident potential zone). The site is located in a tsunami evacuation zone and partially in a high-probability flood zone, which poses risks of property damage and safety risks. The Perimeter Road Site does not meet all screening criteria.
Move VR-51 to Barbers Point, Oahu; new hangar construction	The Navy has consulted the U.S. Coast Guard planners and the State Department of Transportation, who both control portions of land on Barbers Point. The U.S. Coast Guard indicates they have neither hangar space nor available land for this project (Dunlap, 2022). Similarly, the Property Manager with the State DOT stated there was no available land for this project (Fujioka, 2022). Additionally, the secure communications network at USCG Barbers Point is not compatible with the Naval Force Secure Requirement. The Barbers Point option does not meet all screening criteria.
Move VR-51 to Joint Base Pearl Harbor Hickam (JBPHH); new hangar construction	The JBPHH Site Survey Report prepared in 2017 by Boeing Global Services for VR-51 identified four hangar site options. The sites included building over Installation Restoration (IR) sites/inactive landfill areas or at locations that are a long distance away from the proposed C-40 aircraft parking area. The Air Force has also been looking at Hickam to bed down the KC-46 aircraft. Locations for the KC-46 hangar and parking apron overlap much of the options reviewed in 2017. The survey looked at use of existing hangars, but availability was limited and squadron offices would need to be located away from the operational hangar. The way aircraft maintenance is done at MCBH is more in line with how VR-51 prefers to operate. Hickam does not allow fuel cell venting within the hangar and towing of the aircraft in and out of the hangar (crossing red lines) requires consultation/ coordination with Air Force police/security for every movement. Constructing a hangar at Hickam Airfield would require the relocation of VR-51 from MCBH, where it is currently established. New Construction at JBPHH does not meet all screening criteria
Wheeler Air Force Base (AFB), Oahu	Wheeler Army Airfield is a military-controlled airfield. Its 5,600-foot runway is minimally adequate to accommodate the C-40A's 5500-foot take-off distance. However, Wheeler Army Airfield lacks existing hangar space for new aircraft; has an insufficient amount of undeveloped land to accommodate the minimum footprint for a new hangar, apron, and

Name of Alternative	Why not carried forward for detailed analysis
	supporting facilities; and the airfield is fully developed and committed to other aircraft operations. Federal Aviation Administration information for the airfield describes it as located in an extremely noise sensitive area (AirNav, 2023). Wheeler Army Airfield does not have a secure communications network compatible with the Naval Force Secure Requirement. New construction at Wheeler AFB does not meet all screening criteria.
Dillingham Military Reservation, Oahu	Dillingham Military Reservation 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 VR-51 infrastructure, and HDOT has given no indication it is receptive to modifying its lease. 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 C-40A at 171,000 pounds (maximum take-off weight); per FAA, the Dillingham runway is rated for 152,000 pound gross weight for dual-wheel aircraft (FAA, 2023). The entire runway would require demolition and reconstruction to accommodate the weight of C-40A aircraft. The airfield is also unlighted with no control tower. The airfield is fully developed and committed for general aviation operations and lacks enough undeveloped acreage for construction of a new hangar. The site does not have a secure communications network or secure facility access. New construction at Dillingham Military Reservation does not meet all screening criteria.

Determination of Effect

As a result of our continuing consultation, the Navy and MCBH have determined that the proposed undertaking will adversely affect the Aviation District. These effects to the built environment include the direct adverse effect of demolishing Hangar 104, a contributing building within the Aviation District. Through consulting parties' input during consultation meetings and in written comments, the Navy and MCBH have also determined that the undertaking will diminish the integrity of the Kaneohe Naval Air Station National Historic Landmark (NHL) by altering the setting and characteristic view of hangar row from key viewpoints through the demolition and replacement of the historic hangar.

Responding to questions regarding archaeological resources, MCBH and the Navy have engaged in substantive discussions with all parties to this consultation to clarify the determination of effect and outline measures to address discoveries. Recognizing the possibility of intact archaeological deposits beneath the present hangar and associated surface coverings, we have proposed to conduct controlled archaeological testing through mechanical and hand excavations, prior to the start of the P-2001 project, in order to reduce the risk of inadvertent effects of encountering archaeological deposits during construction. Additionally, all ground disturbing activities included in the P-2001 project will be monitored. While there are no known archaeological sites present within the project footprint, the proximity of SIHP #50-80-11-05829

supports a decision to conduct combined mechanical and hand testing, prior to, and monitoring during the demolition process when the ground layers are accessible to ensure that any deposits are appropriately identified, tested, and documented, consistent with phased identification under 800.4(b)(2), including supplementary consultations with Native Hawaiian Organizations.

The next Section 106 consultation meeting is scheduled for **Thursday, 09 March 2023, at 9:00 a.m.** to continue discussions and development of the P-2001 MOA to resolve the adverse effects described above. We will provide meeting materials and an Agenda 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.

J. P. HART
By direction

-10'00'

Enclosure: 1. Summaries of P-2001 Section 106 consultation meetings conducted, and distributed to consulting parties, to date.

Copy to:
Chair, Oahu Island Burial Council (via Regina Hilo, SHPD and OIBC Chair)
Chair, Office of Hawaiian Affairs
Ms. Anuhea Diamond, Diamond ‘Ohana
Ms. Skye Razon-Olds, Olds ‘Ohana
Ms. Emalia Keohokalole, Keohokalole ‘Ohana
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
Mr. Clive Cabral, Temple of Lono
Ms. Kaleo Paik, Paik `Ohana
Ms. Elaine Jackson-Retondo, National Park Service
Ms. Kiersten Faulkner, Historic Hawaii Foundation
Ms. Elizabeth Merritt, National Trust for Historic Preservation
Mr. Morgan Rowley

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

IN REPLY REFER TO
5090
LFE/029-23
March 3, 2023

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

Dear Dr. Downer:

SUBJECT: SECTION 106 CONTINUING CONSULTATION (ARCHITECTURE & ARCHAEOLOGY): MILCON P-2001 C-40 AIRCRAFT MAINTENANCE HANGAR & PARKING APRON ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF KOʻOLAUPOKO, AHUPUAʻA OF HEʻEIA, ON THE ISLAND OF OʻAHU, TMK 1-4-4-008:001.

Thank you for your letter dated 27 December 2021 (Doc. No.: 2112SH18), within which your office responded to the Marine Corps Base Hawaii (MCBH) initial Section 106 letter dated 21 November 2021 (LFE/204-21) for the P-2001 C-40 Aircraft Maintenance Hangar and Parking Apron project (HICRIS Project No.: 2021PR01494). This letter responds to the State Historic Preservation Division (SHPD) request for additional information in your 27 December 2021 letter. The project proposes to construct a new C-40 aircraft maintenance hangar and parking apron on the footprint of Hangar 104. Currently, the C-40 aircraft are parked in the open on the apron at Hangar 105 where inclement weather poses multiple risks if they are in non-flyable condition during such event.

CONTINUING CONSULTATION

Our continuing Section 106 consultation with your office, the National Park Service, Native Hawaiian Organizations, Historic Hawaii Foundation, and the National Trust for Historic Preservation has provided information and materials to support the MCBH determination that the proposed undertaking will adversely affect the Naval Air Station (NAS) Kaneohe Aviation Historic District (Aviation District) and diminish the integrity of the Kaneohe Naval Air Station National Historic Landmark District (NHL) by altering the nearby setting. The undertaking's effects include the direct adverse effect of demolishing Hangar 104, eligible for listing in the National Register of Historic Places (NRHP) as a contributing resource to the Aviation District. Additionally, it will diminish the integrity of the NHL by altering the historic setting and the characteristic views of hangar row from key viewpoints.

RESPONSE TO REQUESTS FOR INFORMATION

Responding to questions regarding archaeological resources, MCBH and the Navy have engaged in substantive discussions with all parties to this consultation to clarify the determination of effect and outline measures to address discoveries. Recognizing the possibility of intact archaeological deposits beneath the present hangar and associated surface coverings, we have proposed to conduct controlled archaeological testing through mechanical and hand excavations, prior to the start of the P-2001 project, in order to reduce the risk of inadvertent effects of encountering archaeological deposits during construction. Additionally, all ground disturbing activities included in the P-2001 project will be monitored. While there are no known archaeological sites present within the project footprint, the proximity of SIHP #50-80-11-05829 supports a decision to conduct combined mechanical and hand testing, prior to, and monitoring during the demolition process when the ground layers are accessible to ensure that any deposits are appropriately identified, tested, and documented, consistent with phased identification under 800.4(b)(2), including supplementary consultations with Native Hawaiian Organizations.

Through our ongoing consultations for the proposed undertaking, consulting parties have requested additional information regarding the viability of potential alternatives and the level of analysis under the National Environmental Policy Act (NEPA). The Navy and MCBH have responded during consultation meetings and in correspondence, and per your request, we have included in enclosure 1 the Section 106 consultation meeting summaries conducted and distributed to consulting parties to date. Additionally, the Navy and MCBH will include in the NEPA public notice of availability of the P-2001 Environmental Assessment (EA) a Section 106 notice soliciting input from the public regarding ways to resolve the adverse effects of the proposed undertaking. MCBH will share public comments received with your office after the end of the public comment period for the P-2001 Environmental Assessment (EA).

DETERMINATION OF EFFECT

As stated in the MCBH initial Section 106 letter (dated 21 November 2021), MCBH has determined that the proposed undertaking will adversely affect the NAS Kaneohe Aviation Historic District in accordance with Section 106 Implementing Regulations at 36 CFR 800.5(d)(2) based on the following: 1) demolition of Hangar 4, which is eligible for the National Register as a contributing element of the NAS Kaneohe Aviation Historic District. Through consulting parties' input during consultation meetings and in written comments, MCBH has also determined that the undertaking will diminish the integrity of the Kaneohe Naval Air Station NHL by altering the setting and characteristic view of hangar row from key viewpoints through the demolition and replacement of the historic hangar. In accordance with Section 106 Implementing Regulations at 36 CFR 800.6(b) and (c), MCBH will continue consulting with the SHPO and the consulting parties listed below to develop and execute a Memorandum of Agreement (MOA) that will avoid, minimize or mitigate this undertaking's adverse effects on historic properties. MCBH is forwarding copies of this letter to the consulting parties listed below, including Native Hawaiian Organizations (NHOs).

MCBH will be holding our next Section 106 consultation meeting on **Thursday, 09 March 2023, at 9:00 a.m.**. We will provide an agenda and meeting materials 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,

J. P. HART
By direction

Enclosure: 1. Summaries of P-2001 Section 106 consultation meetings conducted and distributed to consulting parties, to date.

Copy to:
Chair, Oahu Island Burial Council (via Regina Hilo, SHPD and OIBC Chair)
Chair, Office of Hawaiian Affairs
Ms. Anuhea Diamond, Diamond ‘Ohana
Ms. Skye Razon-Olds, Olds ‘Ohana
Ms. Emalia Keohokalole, Keohokalole ‘Ohana
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
Mr. Clive Cabral, Temple of Lono
Ms. Kaleo Paik, Paik `Ohana
Ms. Elaine Jackson-Retondo, National Park Service
Ms. Kiersten Faulkner, Historic Hawaii Foundation
Ms. Elizabeth Merritt, National Trust for Historic Preservation
Mr. Morgan Rowley

APPENDIX C – ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

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

IN REPLY REFER TO
5090
LFE/125-22
January 30, 2023

Field Supervisor
U.S. Fish and Wildlife Service, Pacific Islands Office
Room 3-122, Box 50088
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Field Supervisor,

SUBJECT: SECTION 7 INFORMAL CONSULTATION FOR CONSTRUCTION OF THE NAVY VR51 HANGAR, MARINE CORPS BASE HAWAII, KANEOHE BAY

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations (50 CFR Part 402), Marine Corps Base Hawaii (MCBH) requests informal consultation related to the proposed construction of a Type III high-bay aircraft maintenance hangar with low-rise space for administration, maintenance and aircraft/spares storage at MCBH Kaneohe Bay.

MCBH has developed this Biological Assessment (BA) (Enclosure 1) to assess potential impacts to the species shown in Table 1. Based on this BA, MCBH requests an initiation of informal consultation pursuant to Section 7(a)(2) of the ESA, and your concurrence with the effects determination for the ESA-listed species that may occur within the action area. Since the action is not expected to affect the sea turtle species, only the Hawaiian hoary bat and bird species have been carried forth for analysis.

Table 1. Special-Status Species Known to Occur or with Potential to Occur in the Project Area and Region of Influence

Hawaiian Name	Common Name	Scientific Name	Effects Determination
ʻōpeʻapeʻa	Hawaiian hoary bat	*Lasiurus cinereus semotus*	No Effect
ʻalae keʻokeʻo	Hawaiian coot	*Fulica alai*	Not likely to Adversely Affect
ʻalae ʻula	Hawaiian gallinule	*Gallinula mexicanus sandvicensis)*	Not likely to Adversely Affect
koloa	Hawaiian duck	*Anas wyvilliana*	Not likely to Adversely Affect
aeʻo	Hawaiian stilt	*Himantopus mexicanus knudseni*	Not likely to Adversely Affect
ʻaʻo	Newell's shearwater	*Puffinus auricularis newelli*	Not likely to Adversely Affect

ʻuaʻu	Hawaiian petrel	*Pterodroma phaeopygia sandwichensis*	Not likely to Adversely Affect
ʻakeʻake	Band-rumped storm petrel	*Oceanodroma castro*	Not likely to Adversely Affect
honu	Central North Pacific District Population Segment of the Green sea turtle	*Chelonia mydas*	No Effect
honu'ea	Hawksbill sea turtle	*Eretmochelys imbricata*	No Effect

We look forward to your review of and concurrence with MCB Hawaii's determination on the species included in this informal consultation. Please direct correspondence regarding this matter to Lance Bookless, MCBH Senior Natural Resource Manager at lance.bookless1@usmc.mil, (808) 257-7000.

Sincerely,

J. P. HART
By Direction

Enclosure: 1. Biological Assessment for construction of the VR51 Hangar, Marine Corps Air Station, Kaneohe Bay, Hawaii

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
2023-0044963-S7

March 22, 2023

Major Jeffry Hart, Director
Environmental Compliance and Protection Division
Facilities Department
Marine Corps Base Hawaii
Kaneohe Bay, Hawaii 96863-3002

Subject: Informal Consultation for Construction of VR51 Hangar and C-40 Aircraft Parking Apron, MCBH Kaneohe, Oahu, Hawaii

Dear Major Hart:

The U.S. Fish and Wildlife Service (Service) received your January 30, 2022, letter, requesting informal consultation. The Marine Corps proposes the construction of a Type II high-bay aircraft maintenance hangar with low-rise space for administration, maintenance and aircraft/spares storage at MCBH Kaneohe Bay, Oahu, Hawaii. You requested our concurrence with your "may affect, but not likely to adversely affect" determination for the following species:

- Hawaiian waterbirds
  - Hawaiian stilt (*Himantopus mexicanus knudseni*)
  - Hawaiian coot (*Fulica americana alai*)
  - Hawaiian gallinule (*Gallinula galeata sandvicensis*)
  - Hawaiian duck (*Anas wyvilliana*)
- Hawaiian seabirds
  - Hawaiian petrel (*Pterodroma sandwichensis*),
  - Hawaii DPS of the band-rumped storm-petrel (*Oceanodroma castro*) and
  - Newell's shearwater (*Puffinus auricularis newelli*)

We based our analysis and decisions on the Biological Assessment (BA) for this project and other pertinent data. A complete consultation record is on file at our office. Our response is in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

Project Description

The proposed action is to construct a Type II squadron operation and maintenance facility for Fleet Logistics Support Squadron (VR-51) and the C-40 airframe and aircraft-parking apron for two C-40 aircraft. The hangar will provide a weather protected shelter for inspection, service and maintenance for the C-40 aircraft. The hangar also provides Support Equipment (SE) maintenance and storage space for the P-8A detachment. The high-bay aircraft hangar will have steel-frame construction, standing seam metal roof over metal deck, concrete filled metal deck floors, fire suppressant floor trenches and pile foundation. The hangar may be operational 24-hours a day. Outdoor security lighting will be installed around the exterior of the hangar. High intensity lighting will be required inside the hangar.

The exterior dimensions of the proposed aircraft hangar is 280 ft wide by 200 ft deep by 84 ft high. The aircraft access apron and aircraft parking area would cover 39,719 sq ft. A total of 525 ft of fence will either be upgraded or newly constructed around the property. The fence is designed as 7 ft chain-link fabric and does not include barbed wire. The life of the fence is expected to be 20 years.

To achieve the necessary airfield setbacks, the proposed hangar footprint would displace some of the existing covered parking for the MCAS Terminal; require the demolition of two warehouses, and its access road (A Street). The hangar would also displace a portion of Crescent Drive and Mokapu Road. The hangar itself would cover approximately 1.7 acres.

Conservation measures

The following conservation measures will be implemented to avoid and minimize impacts to listed species and their habitats:

General

All construction contractors and aircraft squadron personnel will participate in MCB Hawaii Kaneohe Bay's existing natural resources education program. The program will 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.

Hawaiian Waterbirds

- During construction, areas of standing water will be eliminated to minimize attraction of waterbirds.

- During construction, in areas where waterbirds are known to be present, reduced speed limits will be posted and implemented, and project personnel and contractors will be informed about the presence of endangered species on-site.

- If a waterbird nest or active brood is found within the project site:
  - The USFWS will be notified within 24 hours.
  - A 100-foot buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration will be conducted within this buffer.
  - A biological monitor that is familiar with the species' biology will be present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Hawaiian Seabirds

- All construction activities will occur during daylight hours.

- All windows, doors, and walls will include tinted glass or film resulting in visible light transmittance (VLT) value of 30% or less (inside to outside).

- Aircraft hangars shall not use translucent doors and will have minimal windows. The hangar doors will be solid and not allow interior light to pass through. If a hangar door has a window requirement, tinting is required with a VLT value of 30% or less (inside to outside).

- Unless nighttime operations are in progress, doors will remain shut at night to prevent light emitting outward. This could include partially closing doors and turning off lighting when operations are not occurring, as well as incorporation of an easy-to-use light switching system. Doors will allow user to open and close with ease to ensure that hangar doors can be shut at night to prevent light emitting outward.

- Exterior lighting will follow MCB Hawaii standards (MCB Hawaii, 2022). 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, p. C2-15) and will be reviewed by the MCB Hawaii environmental team.

- Construction and operation of new and renovated buildings along the flightline will be coordinated with MCB Hawaii Environmental Division Natural Resources and shall follow lighting requirements to the maximum extent feasible to prevent seabirds from being attracted to areas with aircraft operations, by implementing the following:

  - The wavelength of all exterior lighting should be equal to or greater than 560 nanometers.
  - Exterior lighting will be shielded (points downward) and full cutoff.

  - Set controls to be "On" only when needed and have ability to shut off lighting when not in use.
  - Use timers and motion-activated lighting to minimize unnecessary light remaining on throughout the night.
  - Minimize light trespass. Light only 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 and shielded bollards in parking areas and sidewalks, and full cutoff and shielded wall packs for walkways and entrances/exits.
  - Affix light fixtures as low as possible to the ground.
  - Use warm light sources for exterior lighting.
- Use of exterior lights during the seabird fledging period (Nov-Dec) will be limited and hangar bay doors will be kept closed.
- Interior areas of the hangars will be designed with netting or slanted surfaces to keep birds from nesting in the hangar.

Effects of the Proposed Action

Hawaiian Waterbirds

Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes, coastal estuaries and ponds. All four waterbirds have been observed on MCBH in natural and man-made wetlands and habitats. Due to the proximity of wetlands, the Hawaiian stilt and Hawaiian duck have been observed near the project area, particularly when ponding occurs on developed surfaces. The Hawaiian coot and Hawaiian gallinule occur in wetlands at MCBH Kaneohe Bay, primarily at the Percolation Ditch, the Klipper Golf Course Ponds, and freshwater influenced portions of the Nu'upia Ponds (MCB Hawaii, 2017); however, they are not known to occur in the project area. Standing waters attract birds such as the Hawaiian stilt, Hawaiian duck, and introduced cattle egrets. USDA Wildlife Services regularly disperses Hawaiian stilts off the airfield.

There is minimal risk of injury or death to birds due to vehicle or equipment collisions during construction. Conservation measures described above to prevent temporary ponding would minimize attraction of birds to the construction area. In accordance with existing permits, current bird hazing activities would continue to be conducted by the USDA Wildlife Services to discourage birds from the airfield where they may be at risk of aircraft strikes.

Construction and aircraft noise would result in temporary impacts to waterbirds. 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 would temporarily relocate from the construction areas to adjacent similar habitats, and would resume their normal behaviors shortly thereafter.

We do not expect a measurable disruption to their normal behaviors or disruption of nesting and rearing of young, and consequently no reduction in reproductive success or reduced fitness. Therefore, effects to waterbirds are considered insignificant or discountable.

Hawaiian Seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Hawaiian seabirds have been documented on Oahu, but are not known to breed on Oahu (Pyle and Pyle 2017; Young et al. 2019. Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction. Implementation of conservation measures is expected to minimize project-related light attraction, therefore, effects to seabirds are considered discountable.

Summary

We have reviewed our data and conducted an effects analysis of your project. By incorporating the conservation measures listed above, effects to listed species are either too small to be meaningful or measurable, or extremely unlikely to occur. Therefore, effects are expected to be insignificant and discountable. Because impacts from the proposed project are insignificant and discountable, we concur with your determination that the proposed action may affect, but is not likely to adversely affect the Hawaiian stilt, Hawaiian coot, Hawaiian gallinule, Hawaiian duck, Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel.

Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; 2) if the identified action is subsequently modified in a manner that causes an effect to the listed species that was not considered in the written concurrence; or, 3) if a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your efforts to conserve endangered species. If you have any questions concerning this consultation, please contact James Kwon, Fish and Wildlife Biologist, at 808-792-9433 or by email at james_kwon@fws.gov. When referring to this project, please include this reference number 2022-0044963-S7.

Sincerely,

Lorena Wada
Planning and Consultation Team Manager

Literature Cited

MCB Hawaii. 2017. Marine Corps Base Hawaii Integrated Natural Resources Management Plan Update (2017-2021).

MCBH Hawaii. 2022. Marine Corps Base Hawaii Standards for Exterior Lighting. Environmental Compliance and Protection Division, Natural Resources. July 2022.

Pyle, R. L., and P. Pyle. 2017. The Birds of the Hawaiian Islands: Occurrence, History, Distribution, and Status. B.P. Bishop Museum, Honolulu, HI, U.S.A. http://hbs.bishopmuseum.org/birds/rlp-monograph/

Young, L. C., VanderWerf, E. A., McKown, M., Roberts, Paige, Schlueter, J., Vorsino, A., and D. Sischo. 2019. Evidence of Newell's Shearwaters and Hawaiian Petrels on Oahu, Hawaii. The Condor: Ornithological Applications: 121: 1–7.

APPENDIX D – COASTAL ZONE MANAGEMENT ACT COORDINATION

From: Bomar CIV Jacquelyn C
To: "Mendes, Debra L"
Cc: Peterson, Dorothy S CIV USN COMNAVFACSYSCOM (USA); Hart, Jeffry P Maj USMC (USA)
Subject: Notification of Proposed C-40A Hangar Construction at Marine Corps Base Hawaii Kaneohe Bay as Navy/Marine Corps De Minimis Activities under CZMA
Date: Tuesday, February 21, 2023 3:04:23 PM

Aloha Ms. Mendes,

The U. S. Marine Corps is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA), as implemented by the Council on Environmental Quality regulations, Department of the Navy Regulations, and Marine Corps Order 5090.2 for implementing NEPA. The proposed action is to construct a maintenance hangar for C-40A aircraft operated by Fleet Logistics Support Squadron 51 (VR-51) of the U.S. Naval Air Force Reserve. VR-51 is a tenant activity on Marine Corps Base Hawaii (MCBH). The proposed action is needed to ensure VR-51 has adequate indoor space to conduct required inspection, service, maintenance, and corrosion prevention for their C-40A aircraft and to provide shelter for a single aircraft during storm events.

The proposed action (preferred alternative) would demolish Hangar 104 and build a new hangar within its footprint that meets the airframe's size requirements. The Hangar 104 site is located along Bravo Ramp, which is adjacent to Kaneohe Bay.

The proposed action falls within the Navy/Marine Corps De Minimis Activities under CZMA, Item 1: New Construction, and Item 11: Demolition:

> Item 1. Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.
>
> Item 11. Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.

The relevant project mitigation/general conditions under the De Minimis agreement for New Construction and Demolition actions are: 1, 3, 6, 8, 9, 10, 11, 12, 13, 14, 16:

> 1. Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.
> 3. Turbidity and siltation from project related work will be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
> 6. No project-related materials (fill, revetment, rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
> 8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.

9. Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms will be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).
12. Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
13. Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the ESA.
14. The NEPA review process will be completed.
16. Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an EA.

Please contact me if you have any questions by email or phone.

V/R,

Jackie Bomar

NEPA Program Manager and Acting Deputy Director
Environmental Compliance and Protection Division
MCBH Kaneohe Bay

From: Mendes, Debra L
To: Bomar, Jacquelyn C CIV USMC (USA)
Cc: Peterson, Dorothy S CIV USN COMNAVFACSYSCOM (USA); Hart, Jeffry P Maj USMC (USA); justine.kimball@resources.ca.gov
Subject: [Non-DoD Source] RE: Notification of Proposed C-40A Hangar Construction at Marine Corps Base Hawaii Kaneohe Bay as Navy/Marine Corps De Minimis Activities under CZMA
Date: Friday, March 3, 2023 4:16:57 PM

Jackie Bomar,
Thank you for the additional information. This acknowledges receipt of the notification by the U.S. Marine Corps use of the CZMA De Minimis List for the subject Proposed C-40A Hangar Construction at Marine Corps Base Hawaii Kaneohe Bay. This Hawaii CZM Program acknowledgement of receipt does not represent an endorsement of the proposed activity.

Thank you,
Debra Mendes
Hawaii Coastal Zone Management Program

From: Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>
Sent: Wednesday, February 22, 2023 11:09 AM
To: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Cc: Peterson, Dorothy S CIV USN COMNAVFACSYSCOM (USA) <dorothy.s.peterson6.civ@us.navy.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; justine.kimball@resources.ca.gov
Subject: [EXTERNAL] RE: Notification of Proposed C-40A Hangar Construction at Marine Corps Base Hawaii Kaneohe Bay as Navy/Marine Corps De Minimis Activities under CZMA

Hello Mrs. Mendes,

Attached are some location maps for your review. The project hasn't gone into design yet therefore we don't have plans at the moment.

V/R,

Jackie Bomar

NEPA Program Manager and Acting Deputy Director
Environmental Compliance and Protection Division
MCBH Kaneohe Bay

APPENDIX E – AIR EMISSIONS WORKSHEETS

Alt 1 - Site 104

Vehicle Type	Avg Daily Workers	RT Distance miles	Weeks	Trips/ week	vehicle miles	Bldg/area footprint sf	lbs per sf	weight (tons)	14 tons/ truck	mileage plus 10% RT	NOx emission factor (lb/mi)	Tons of NOX	VOC emission factor (lb/mi)	Tons of VOC	PM10 emission factor (lb/mi)	Tons of PM10	CO emission factor (lb/mi)	Tons of CO	SOX emission factor (lb/mi)	Tons of Sox	CO2 emission factor (lb/mi)	Tons of CO2
Commuter light duty gasoline veh	15	20	100	5	150000						0.0015	0.115	0.0023	0.171	0.0000	0.001	0.0207	1.554	NA		0.8122	60.91
Commuter light duty gasoline trucks	15	20	100	5	150000						0.0021	0.157	0.0027	0.202	0.0000	0.001	0.0261	1.958	NA		1.1321	84.90
heavy diesel trucks - mobilization/demob	2	34	12	4	3264						0.0190	0.031	0.0010	0.002	0.0005	0.001	0.0051	0.008	NA		9.96	16.26
heavy diesel trucks - matl removal		66			49161	120000	158	9480	677	745	0.0190	0.467	0.0010	0.024	0.0005	0.012	0.0051	0.125	NA		9.96	244.94
diesel trucks-bldg matl delivery		34			458	79000	4.34	171.43	12	13	0.0190	0.004	0.0010	0.000	0.0005	0.000	0.0051	0.001	NA		9.96	2.28

vehicle type	RT distance	Area footprint (sf) (acre= 43560 sf)	depth (ft)	veh miles	volume (cy)	lbs per cy	weight (tons)	14 tons/ truck	plus 10% rt	Nox emission factor (lb/mi)	Tons of NOX	VOC emission factor (lb/mi)	Tons of VOC	PM10 emission factor (lb/mi)	Tons of PM10	CO emission factor (lb/mi)	Tons of CO	SOX emission factor (lb/mi)	Tons of Sox	CO2 emission factor (lb/mi)	Tons of CO2
Heavy diesel trucks - transport asphalt	30	169884	1	30700	18876	1380	13024	930	1023	0.0190	0.291	0.0010	0.015	0.0005	0.007	0.0051	0.078			1.93	29.63
Heavy Diesel trucks - transport topsoil/fill	30	3000	0.3	163	100	1380	69	5	5	0.0190	0.002	0.0010	0.000	0.0005	0.000	0.0051	0.000			1.93	0.16
Heavy Diesel trucks - transport concrete	30	110000	0.4	23336	4889	4050	9900	707	778	0.0190	0.222	0.0010	0.011	0.0005	0.006	0.0051	0.059			1.93	22.52
									TOTALS Transport		1.288		0.426		0.027		3.785				461.60

Equipment	Number	weeks	days/ week	hours/ day	total hrs of operation	Horse Power	Load factor		NOX emission factor (lb/hp-hr)	Tons of NOX	VOC emission factor (lb/hp-hr)	Tons of VOC	PM emission factor (lb/hp-hr)	Tons of PM	CO emission factor (lb/hp-hr)	Tons of CO	SOX emission factor (lb/hp-hr)	Tons of SOX	CO2 emission factor (lb/HP-hr)	Tons of CO2
Backhoe	2	6	5	6	360	79	46.5		0.022	0.145	0.003	0.020	0.001	0.007	0.015	0.099	0.002	0.013	1.523	0.274
Front end loader	1	8	5	4	160	158	54		0.011	0.075	0.002	0.014	0.002	0.014	0.007	0.048	0.021	0.143	1.181	0.094
forklift	2	80	5	3	2400	43	51		0.019	0.500	0.005	0.132	0.093	2.447	0.52	13.684	0.002	0.053	1.523	1.828
motor grader	1	12	4	5	240	99	56		0.01	0.067	0.001	0.007	0.001	0.007	0.0001	0.001	0.002	0.013	1.182	0.142
crane	2	80	5	4	3200	194	43		0.023	3.070	0.003	0.400	0.002	0.267	0.009	1.201	0.002	0.267	1.169	1.870
demolition hammer	3	16	5	6	1440	50	73		0.047	1.235	0.003	0.079	0.004	0.105	0.018	0.473	0.004	0.105	1.18	0.850
gas powered generator	2	16	5	4	640	13	68		0.002	0.006	0.003	0.008	0.0001	0.000	1.479	4.184	0.001	0.003	2.694	0.862
								TOTALS Onsite Constr Equipment		5.098		0.659		2.847		19.690		0.597		5.920

Alt 1 - Site 104, Continued

Asphalt and Fugitive Emissions

	Area (s.f.)	Depth (ft)	Volume (cf)	VOC emission factor (lbs/cf)	VOC emissions (tons)
Asphalt Paving	169884	0.4	67954	0.21	7.14

	linear feet	PM10 factor (lbs/lf)	Total PM (tons)
Fugitive Dust From Trenching	1000	0.00038	0.00019

	Square Feet	Acres	Vehicle miles traveled (at 3 mi/acre)	PM Factor (lbs/VMT)	Total PM 10 (tons)
Fugitive Dust from Grading	169884	3.9	12	0.275	0.002

	Square Feet	Acres	Days	PM10 factor (lbs/acre/ day)	Total PM10 (tons)
Fugitive Dust Exposed Soil	169884	3.9	90	2.08	0.094

Summary of Construction	Tons of NOX	Tons of VOCs	Tons of PM10	Tons of CO	Tons of SOX	Tons of CO2
Construction transport vehicles	1.29	0.43	0.03	3.78	0.00	461.6
On Site Construction Equipment	5.10	0.66	2.85	19.69	0.60	5.9
Paving & fugitive emissions		7.14	0.10			
Totals	**6.39**	**8.22**	**2.97**	**23.47**	**0.60**	**467.5**
2025 (36pct)	2.30	2.96	1.07	8.45	0.22	168.31
2026 (48pct)	3.07	3.95	1.43	11.27	0.29	224.41
2027 (16 pct)	1.02	1.32	0.48	3.76	0.10	74.80

Alt 2 - Green Field Site

Vehicle Type	Avg Daily Workers	RT Distance miles	Weeks	Trips/ week	vehicle miles	Bldg/area footprint sf	lbs per sf	weight (tons)	14 tons/ truck	mileage plus 10% RT	NOx emission factor (lb/mi)	Tons of NOX	VOC emission factor (lb/mi)	Tons of VOC	PM10 emission factor (lb/mi)	Tons of PM10	CO emission factor (lb/mi)	Tons of CO	SOX emission factor (lb/mi)	Tons of Sox	CO2 emission factor (lb/mi)	Tons of CO2
Commuter light duty gasoline veh	15	20	100	5	150000						0.0015	0.115	0.0023	0.171	0.0000	0.001	0.0207	1.554	NA		0.8122	60.91
Commuter light duty gasoline trucks	15	20	100	5	150000						0.0021	0.157	0.0027	0.202	0.0000	0.001	0.0261	1.958	NA		1.1321	84.90
heavy diesel trucks - mobilization/demob	2	34	16	4	4352						0.0190	0.041	0.0010	0.002	0.0005	0.001	0.0051	0.011	NA		9.96	21.68
heavy diesel trucks - matl removal		66			4261	10400	158	821.6	59	65	0.0190	0.040	0.0010	0.002	0.0005	0.001	0.0051	0.011	NA		9.96	21.23
diesel trucks- bldg matl delivery		34			458	79000	4.34	171.43	12	13	0.0190	0.004	0.0010	0.000	0.0005	0.000	0.0051	0.001	NA		9.96	2.28

vehicle type	RT distance	Area footprint (sf) (acre= 43560 sf)	depth (ft)	veh miles	volume (cy)	lbs per cy	weight (tons)	14 tons/ truck	plus 10% rt	Nox emission factor (lb/mi)	Tons of NOX	VOC emission factor (lb/mi)	Tons of VOC	PM10 emission factor (lb/mi)	Tons of PM10	CO emission factor (lb/mi)	Tons of CO	SOX emission factor (lb/mi)	Tons of Sox	CO2 emission factor (lb/mi)	Tons of CO2
Heavy diesel trucks - transport asphalt	34	284011.2	1	58168	31557	1380	21774	1555	1711	0.0190	0.552	0.0010	0.029	0.0005	0.014	0.0051	0.148			1.93	56.13
Heavy Diesel trucks - transport topsoil/fill	34	100000	0.3	6144	3333	1380	2300	164	181	0.0190	0.058	0.0010	0.003	0.0005	0.001	0.0051	0.016			1.93	5.93
Heavy Diesel trucks - transport concrete	34	110000	0.4	26447	4889	4050	9900	707	778	0.0190	0.251	0.0010	0.013	0.0005	0.006	0.0051	0.067			1.93	25.52
										TOTALS Transport	1.219		0.423		0.026		3.766				278.59

Equipment	Number	weeks	days/ week	hours/ day	total hrs of operation	Horse Power	Load factor				NOX emission factor (lb/hp-hr)	Tons of NOX	VOC emission factor (lb/hp-hr)	Tons of VOC	PM emission factor (lb/hp-hr)	Tons of PM	CO emission factor (lb/hp-hr)	Tons of CO	SOX emission factor (lb/hp-hr)	Tons of SOX	CO2 emission factor (lb/HP-hr)	Tons of CO2
Backhoe	2	12	5	6	720	79	46.5				0.022	0.291	0.003	0.040	0.001	0.013	0.015	0.198	0.002	0.026	1.523	0.548
Front end loader	2	9	5	4	360	158	54				0.011	0.169	0.002	0.031	0.002	0.031	0.007	0.108	0.021	0.323	1.181	0.213
forklift	2	80	5	3	2400	43	51				0.019	0.500	0.005	0.132	0.093	2.447	0.52	13.684	0.002	0.053	1.523	1.828
motor grader	1	18	4	5	360	99	56				0.01	0.100	0.001	0.010	0.001	0.010	0.0001	0.001	0.002	0.020	1.182	0.213
crane	2	80	5	4	3200	194	43				0.023	3.070	0.003	0.400	0.002	0.267	0.009	1.201	0.002	0.267	1.169	1.870
demolition hammer	3	20	5	6	1800	50	73				0.047	1.544	0.003	0.099	0.004	0.131	0.018	0.591	0.004	0.131	1.18	1.062
gas powered generator	2	20	5	4	800	13	68				0.002	0.007	0.003	0.011	0.0001	0.000	1.479	5.230	0.001	0.004	2.694	1.078
										TOTALS Onsite Constr Equipment		5.681		0.722		2.900		21.013		0.823		6.811

Alt 2 - Green Field Site, Continued

Asphalt and Fugitive Emissions

Asphalt Paving	Area (s.f.)	Depth (ft)	Volume (cf)	VOC emission factor (lbs/cf)	VOC emissions (tons)
	284011	0.4	113604	0.21	11.93

Fugitive Dust From Trenching	linear feet	PM10 factor (lbs/lf)	Total PM (tons)
	3000	0.00038	0.00057

Fugitive Dust from Grading	Square Feet	Acres	Vehicle miles traveled (at 3 mi/acre)	PM Factor (lbs/VMT)	Total PM 10 (tons)
		8.3	25	0.275	0.003

Fugitive Dust Exposed Soil	Square Feet	Acres	Days	PM10 factor (lbs/acre/day)	Total PM10 (tons)
		8.3	90	2.08	0.094

Summary of Construction	Tons of NOX	Tons of VOCs	Tons of PM10	Tons of CO	Tons of SOX	Tons of CO2
Construction transport vehicles	1.22	0.42	0.03	3.77	0.00	278.6
On Site Construction Equipment	5.68	0.72	2.90	21.01	0.82	6.8
Paving & fugitive emissions		11.93	0.10			
Totals	**6.90**	**13.07**	**3.02**	**24.78**	**0.82**	**285.4**
2025 (36pct)	2.48	4.71	1.09	8.92	0.30	102.75
2026 (48pct)	3.31	6.27	1.45	11.89	0.40	136.99
2027 (16 pct)	1.10	2.09	0.48	3.96	0.13	45.66

Embodied Carbon for Cement used in floors and foundations

Slab thickness	1.5	feet, average (foundation & second floor combined)
area	120000	sf.
cubic feet	180000	rounded up
cubic yards	6700	rounded up
regular, lbs CO2 emitted	2680000	lbs
regular, tons co2 emitted	1340	tons
carbon cure, lbs of co2 emitted	2512500	lbs
carbon cure, tons to co2	1256	tons

Concrete CO2 emission rates	wt in lbs per CY	CO2 emitted in lbs per CY
Typical Concrete	3900	400
Carbon Cure	4050	375

Embodied carbon CO2-e on steel construction products (tonnes/tonne)

	product stage (tons/tons)	recycling potential (tons/tons)	whole life carbon (tons/tons)
Structural Steelwork	1.74	-0.93	0.81

Steel columns (i-beams) estimated per DD1391	131	
	49	lbs/foot
i-beams size 50'x 10"x10"	50	feet
	320950	total lbs
	160.475	tons
Framing steel, 18 guage (e.g. studs)	1.5	lbs/foot
linear distances	775	Int offices
	506.25	perimeter
	375	Shop spaces
	75	doors
	1731.25	Total number
		total feet, avg
	34625	height 20'
		times 1.5
	51937.5	lbs/foot
	25.96875	tons
total steel	186.4	tons
round to	200	tons
embodied carbon @1.74	348	tons CO2e
recycling old hangar with similar steel amounts	-186	tons CO2e avoided

OPERATIONAL DATA

Aircraft Engine	Power Setting	Percent Thrust/hp	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)							
				NO_X	SO_X	CO	VOC	HAPs	PM_{10}	$PM_{2.5}$	CO_2
C-40A											
CFM56-7B24	Idle (Taxi)	7%	865	4.40	1.07	22.00	2.76	---	0.05	0.05	3214.59
	Approach	30%	2508	10.10	1.07	2.20	0.12	---	0.04	0.04	3214.59
	Climb out	85%	7222	20.50	1.07	0.60	0.12	---	0.10	0.09	3214.59
	Takeoff	100%	8754	25.30	1.07	0.40	0.12	---	0.11	0.10	3214.59
	Total		19349	60.30	4.28	25.20	3.12	0.00	0.30	0.28	12858.36
Notes: c(2), e, f, h, k(1)											
C-20G											
TAY Mk611-8	Idle (Taxi)	7%	873	2.50	1.07	24.10	3.91	---	0.16	0.15	3214.59
	Approach	30%	1825	5.70	1.07	3.90	1.04	---	0.52	0.47	3214.59
	Climb out	85%	5000	16.80	1.07	0.80	0.35	---	0.48	0.43	3214.59
	Takeoff	100%	6032	21.10	1.07	0.70	0.92	---	0.56	0.50	3214.59
	Total		13730	46	4	30	6	0	2	2	12858
Notes: c(2), e, f, h, k(1)											

	Power Setting	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)							
			NO_X	SO_X	CO	VOC	HAPs	PM_{10}	$PM_{2.5}$	CO_2
Net Change	Idle (Taxi)	8.000	-1.900	0.000	2.100	1.150		0.110	0.100	0.000
	Approach	-683.000	-4.400	0.000	1.700	0.920		0.480	0.430	0.000
	Climb out	-2222.000	-3.700	0.000	0.200	0.230		0.380	0.340	0.000
	Takeoff	-2722.000	-4.200	0.000	0.300	0.800		0.450	0.400	0.000
		-5619.000	-14.200	0.000	4.300	3.100	0.000	1.420	1.270	0.000

Aircraft	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)							
		NO_X	SO_X	CO	VOC	HAPs	PM_{10}	$PM_{2.5}$	CO_2
C-20G	13730.000	46.100	4.280	29.500	6.220	0.000	1.720	1.550	12858.360
C-40A	19349.000	60.300	4.280	25.200	3.120	0.000	0.300	0.280	12858.360
Total Net Change	**-5619.000**	**-14.200**	**0.000**	**4.300**	**3.100**	**0.000**	**1.420**	**1.270**	**0.000**

APPENDIX F – NOISE STUDY

Final Noise Study
MCBH Kaneohe Bay, Hawaii
February 2025

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ACRONYMS AND ABBREVIATIONS

%	percent
AAD	Average Annual Day
AAM	Advanced Acoustic Model
ANSI	American National Standards Institute
ATCT	Air Traffic Control Tower
CALA	Combat Aircraft Loading Area
dB	Decibel
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DNWG	Department of Defense Noise Working Group
DoD	Department of Defense
FICON	Federal Interagency Committee on Noise
HSM	Helicopter Maritime Strike Squadron
Hz	Hertz
kPa-s/m^2	kilopascal-seconds per square meter
L_{max}	Maximum Sound Level
MCBH	Marine Corps Base Hawaii
NED	National Elevation Dataset
POI	Point of Interest
SEL	Sound Exposure Level
U.S.	United States
USGS	United States Geological Survey
USMC	United States Marine Corps
VMGR	Marine Air Refueler and Transport Squadron
VMM	Marine Medium Tiltrotor Squadron
VMU	Marine Unmanned Aerial Vehicle Squadron
VP	Patrol Squadron

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1.0 INTRODUCTION

1.1 BACKGROUND

This Noise Study is in support of the *Environmental Assessment for Construction of a C-40A Aircraft Maintenance Hangar at Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii.* Military aircraft noise modeling was accomplished using the Department of Defense's (DoD) Noisemap software. The data (numbers and types of aircraft, time of day, runway assignments, type of operation) used were developed with data obtained from recent noise studies and coordination with representatives from the Navy Reserve and Marine Corps Base Hawaii (MCBH) Kaneohe Bay flying squadrons and air traffic controllers.

1.2 DOCUMENT STRUCTURE

Section 1.0 introduced this study and Section 2.0 describes the methodology used in the analysis. Section 3.0 provides the modeling data used and the noise exposure for the existing conditions. Section 4.0 provides the noise exposure for the Preferred Alternative and Section 5.0 presents the discussion on the No Action Alternative. Section 6.0 presents the references.

2.0 METHODOLOGY

The DoD and the Federal Interagency Committee on Noise (FICON) (1978) outline the types of metrics to describe noise exposure for environmental impact assessment, while the Defense Noise Working Group (DNWG) provides guidance on military noise modeling methodology. The following subsections describe these noise metrics and noise modeling methodology.

2.1 NOISE MODELING AND PRIMARY NOISE METRICS

The DoD prescribes use of the Noisemap suite of computer programs (Wyle 1998; Wasmer Consulting 2006) containing the core computational programs called "NMAP," version 7.3. For this Noise Study, the Noisemap suite of programs refers to BASEOPS as the input module, and Noisemap as the noise model for predicting noise exposure in the airfield environment from fixed-wing aircraft operations. Advanced Acoustic Model (AAM) was the noise model used for predicting noise exposure in the airfield environment from rotary- and tilt-wing aircraft operations. Noise grid results from both noise models were combined to develop a complete airfield noise exposure footprint. **Table 2-1** presents noise modeling parameters used in this analysis. Human hearing sensitivity to differing sound pitch, measured in cycles per second or hertz (Hz), varies by frequency. To account for this effect, sound measured for environmental analysis utilizes A-weighting, which emphasizes sound roughly within the range of typical speech and de-emphasizes very low and very high frequency sounds. All decibels (dB) presented in this study utilize A-weighted (dBA or dB[A]) but are presented as dB for brevity, unless otherwise noted.

Table 2-1 Noise Modeling Parameters

Software	***Analysis***	***Version***
NMAP	Airfield noise – fixed wing military aircraft	7.3
AAM	Airfield noise – rotary and tilt wing military aircraft	3.0
Parameter	***Description***	
Receiver Grid Spacing	500 ft in x and y	
Metrics	DNL, SEL	
Basis	AAD Operations	
Topography		
Elevation Data Source	USGS 30m NED	
Elevation Grid Spacing	500 ft in x and y	
Impedance Data Source	USGS Hydrography DLG	
Impedance Grid spacing	500 ft in x and y	
Flow Resistivity of Ground (soft/hard)	225 kPa-s/m^2 / 100,000 kPa-s/m^2	
Military Modeled Weather (Monthly Average 2019)		
Temperature	76°F	
Relative Humidity	74%	
Barometric Pressure	30.05 in Hg	

Legend: °F = degrees Fahrenheit; % = percent; AAD = Average Annual Day; DLG = Digital Line Graph; DNL = Day-Night Average Sound Level; ft = feet; in Hg = inches Mercury; kPa-s/m^2 = kilopascal-seconds per square meter; m = meters; NED = National Elevation Dataset; SEL = Sound Exposure Level; USGS = United States Geological Survey.

The primary noise metric utilized in this analysis for noise impacts is the Day-Night Average Sound Level (L_{dn}, also written as DNL), which is A-weighted applicable for subsonic aircraft operations. DNL is a cumulative metric that includes all noise events occurring in a 24-hour period with a nighttime noise weighting applied to events occurring after 10 p.m. (2200) and before 7 a.m. (0700). The daytime period

is defined as 7 a.m. (0700) to 10 p.m. (2200). An adjustment (weighting) of 10 dB is added to events occurring during the nighttime period to account for the added intrusiveness while people are most likely to be relaxing at home or sleeping. Note that "daytime" and "nighttime" in calculation of DNL are sometimes referred to as "acoustic day" and "acoustic night" and always correspond to the times given above. This is often different than the "day" and "night" used commonly in military aviation, which are directly related to the times of sunrise and sunset applicable for military training in dark conditions. These times vary latitudinally, and throughout the year with the seasonal changes.

DoD Noise Program Policy (DoD Instruction 4715.13, 28 January 2020) requires the use of the DNL noise metric to describe aircraft noise exposure levels at airfields based on average annual day (AAD) averaged over 365 days for purpose of long-term compatible land use planning. Consistent with that standard, this study analyzed both military and civil operations at the airfield on an average annual basis.

While a cumulative metric such as DNL is appropriate to predict the overall noise environment at airfields, additional description of noise impacts to noise sensitive locations requires additional metrics. DoD expands upon DNL with the supplemental metric Sound Exposure Level (SEL) as described in the DNWG guidelines (DNWG 2009). The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or L_{max}, which occurs over one-eighth of a second and denoted as "fast" response on a sound level meter (American National Standards Institute [ANSI] 1988). Although useful in determining when a noise event may interfere with conversation, TV or radio listening, or other common activities, L_{max} does not fully describe the noise because it does not account for how long the sound is heard.

SEL combines both the intensity of a sound and its duration by providing the sound level that would contain the same sound energy of an event if occurring over a 1 second period. This means that SEL does not represent a sound level that is heard directly at any given time. However, SEL provides a much better metric for comparison of aircraft flyovers than L_{max} because it allows normalization of disparate events to their 1 second energy average, which is presented in this analysis for comparison between the alternatives. SEL values are larger than those for L_{max} for the same event because aircraft noise events last more than a few seconds.

Assessment of noise associated with a proposed action requires prediction of future conditions that cannot be easily measured until after implementation or would require excessive cost or time to measure. The solution to this includes the use of computer software to simulate the future conditions, as detailed in the following sections. A congressionally mandated study compared the accuracy of noise modeling methods described in this section to real-world field measurements. The report found that DoD-approved noise models operate as intended providing accurate prediction of noise exposure levels from aircraft operations for use in impact assessments and long-term land use planning (Department of the Navy 2021). The study also determined that the largest variable in any aircraft noise-modeling effort is the expected operational flight parameter data, such as runway and flight track utilization, altitudes at various points in the flight track, engine power settings, and other parameters.

2.1.1 MCBH Kaneohe Bay

This section discusses the airport facilities, air traffic control tower (ATCT), and runways at MCBH Kaneohe Bay and the aircraft noise modeling.

2.1.1.1 Airport Facilities

Runways

MCBH Kaneohe Bay is comprised of one runway, Runway 04/22 oriented in a northeast and southwest direction. All fixed-wing aircraft operations occur along Runway 04/22 which is 7,771 feet in length and 150 feet in width. Tilt-rotor and rotary-wing aircraft were modeled to arrive at runway ends and depart from both the runway ends and runway midfield; additionally, these aircraft completed closed patterns along Runway 04/22, Westfield Training Area, and Combat Aircraft Loading Area (CALA). There are also rotary-wing operations to/from pad 101 and the fuel pits

Aircraft Noise Modeling

Modeling of noise using the Noisemap software suite was accomplished by determining and building each aircraft's flight tracks (paths over the ground) and profiles, which includes altitude, airspeed, power settings, and other flight conditions.

Table 2-2 describes airfield details utilized within this Noise Study. This information was previously developed for use within a prior Environmental Assessment with a team primarily made up of representatives from the base's flying squadrons and air traffic controllers. The data was compiled in a Data Validation Package, reviewed by the team, and approved for use by the MCBH Kaneohe Bay team prior to modeling. This data has been combined with the numbers of each type of operation by aircraft/track/profile, local climate, terrain surrounding the airfield, and similar data related to aircraft engine runs that occur at specific locations on the ground (e.g., pre- and post-flight and maintenance activities). AAM sound hemispheres are utilized for rotary- and tilt-rotor aircraft, while all fixed-wing military aircraft are modeled with NMAP to provide a consistent manner of analysis across alternatives in accordance with DoD standards (DoD 2022).

Table 2-2 MCBH Kaneohe Bay Airfield Details for Noise Modeling

Rwy	*Start*	*End*	*Length*	*Width*	*Elevation*	*Displaced Threshold*	*Traffic Pattern*	*Inst App*
04	21-26.629000N 157-46.614500W	21-27.425667N 157-45.539333W	7,771 ft	200 ft	12 ft	N/A	Left	N/A
22	21-27.425667N 157-45.53933W	21-26.629000N 157-46.614500W	7,771 ft	200 ft	23 ft	N/A	Left	TACAN

Legend: Start and End in Degrees Minutes Latitude and Longitude; ft = feet; Inst App = Instrument Approach; MCBH = Marine Corps Base Hawaii; N/A=non-applicable; Rwy = Runway; TACAN = Tactical Air Navigation
Source: AIRNAV 2024.

Noisemap's ability to account for the effects of sound propagation includes consideration of varying terrain elevation, taken from the United States (U.S.) Geological Survey (USGS) National Elevation Dataset (NED), and ground impedance conditions, taken from USGS Hydrography data. In this case, "soft ground" (e.g., grass-covered ground) is modeled with a flow resistivity of 225 kilopascal-seconds per square meter (kPa-s/m^2) and "hard ground" (in this case, water) is modeled with a flow resistivity of 100,000 kPa-s/m^2. For ambient temperature, humidity, and pressure, each month was assigned a temperature, relative humidity, and barometric pressure from data available for that month for the year 2019, for consistency with the most-recent previous MCBH airfield noise study. Noisemap then determined and used the month with the weather values that produced the median results in terms of noise propagation effect, which in this case was the month of March (with the values noted in **Table 2-1**).

The results of the DoD's Noisemap modeling were combined for all aircraft activity at the airfield for existing (based on 2019) and the Proposed (based upon C-40A implementation). The combined noise exposure contour lines of equal DNL value from 65 to 85 dB, presented in 5-dB increments, provide a graphical depiction of the aircraft noise environment in the vicinity of the airfield. In addition to the DNL plots, specific noise sensitive locations (schools, hospitals, places of worship, and residential neighborhoods) have been identified in the surrounding communities referred to as representative Points of Interest (POIs). **Table 2-3** lists and **Figure 2-1** presents the 33 selected representative POIs used for this study.

Table 2-3 POIs in the Vicinity of MCBH Kaneohe Bay

Map ID	*Point Type*	*Named POI*
C01	Community	ʻĀhuimanu
C02	Community	ʻAikahi Community Park
C03	Community	Coconut Island (Moku-o-loe)
C04	Community	Heʻieia
C05	Community	Heʻieia State Park
C06	Community	Kahuluʻu
C07	Community	Kailua
C08	Community	Kalama Beach Park
C09	Community	Kāneʻohe
C10	Community	Kāneʻohe Beach Park
C11	Community	Kualoa
C12	Community	Kualoa Beach Park
C13	Community	Lanilkai
C14	Community	Maunawili
C15	Community	Oneawa Hills
C16	Community	Waiahole
C17	Community	Waikāne
S01	School	ʻĀhuimanu Elementary School
S02	School	Enchanted Lake Elementary School
S03	School	Heʻeia Elementary School
S04	School	James B. Castle High School
S05	School	Kaʻohao Public Charter School
S06	School	Kahaluʻu Elementary School
S07	School	Kailua Intermediate School
S08	School	Kainalu Elementary School
S09	School	Kalāheo High School
S10	School	Kāneʻohe Elementary School
S11	School	Kapunahala Elementary School
S12	School	S.W. King Intermediate School
S13	School	Maunawili Elementary School
S14	School	Olomana School
S15	School	Saint Mark Elementary School
S16	School	Waiahole Elementary School

Legend: ID = Identification; MCBH = Marine Corps Base Hawaii; POI = Point of Interest

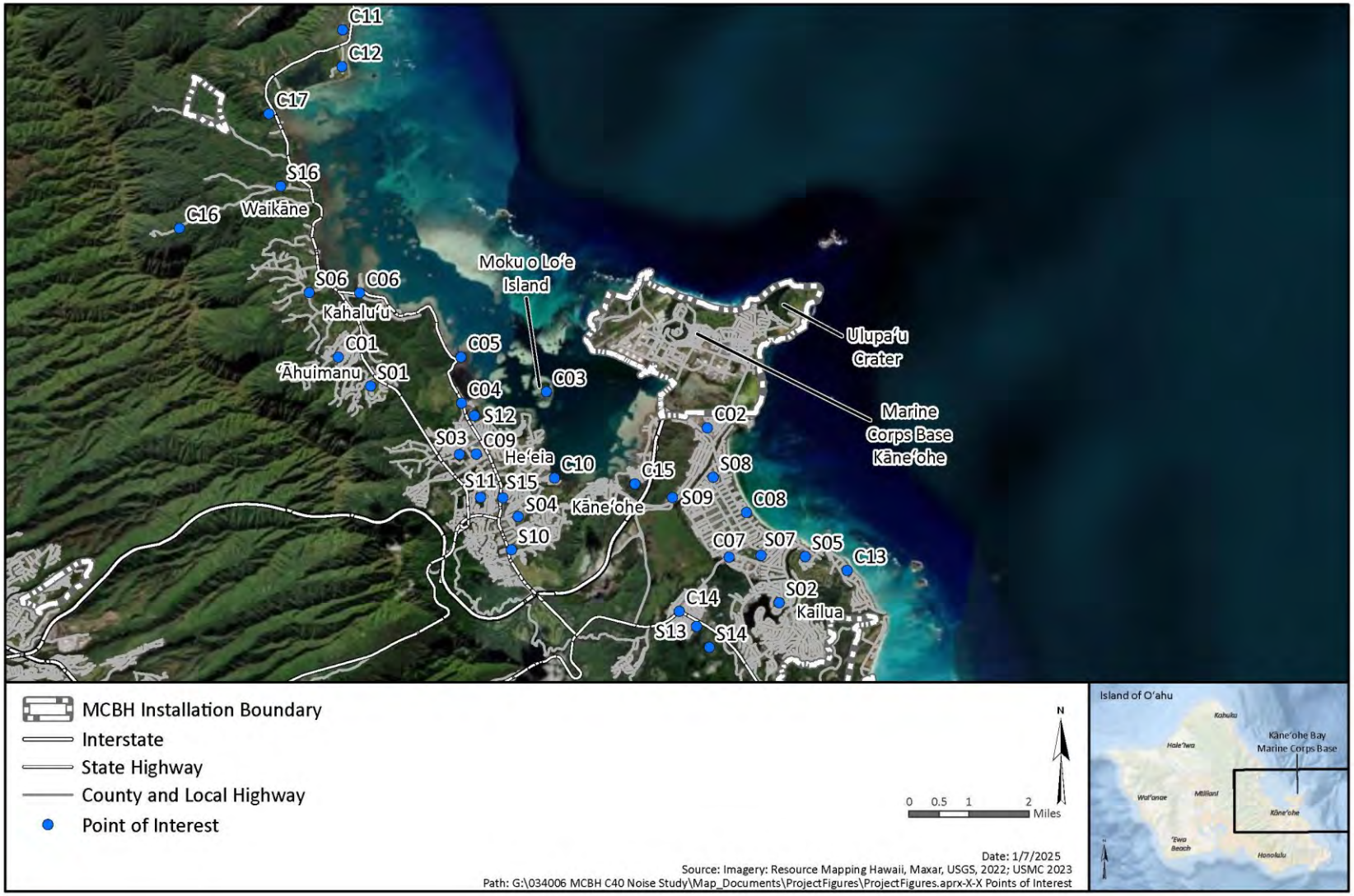

Figure 2-1 Representative POIs in the Vicinity of MCBH Kaneohe Bay

3.0 EXISTING CONDITIONS

The following subsections detail the modeling data and the resultant noise exposure for the existing conditions at the airfield associated with aircraft operations. Airspace noise modeling is not part of this study because the proposed action would not affect airspace operations.

3.1 MODELING DATA

3.1.1 MCBH Kaneohe Bay Airfield Flight Operations

Existing conditions comprises a total of 38,880 flight operations at MCBH Kaneohe Bay with 1,279 operations occurring during the DNL nighttime period, as summarized in **Tables 3-1, 3-2,** and **3-3**. Annual operations were determined through past interviews and confirmation with based Navy and U.S. Marine Corps (USMC) operators and maintenance personnel, and MCBH Kaneohe Bay air traffic control and transient alert personnel (Department of the Navy 2022). The day and night periods in **Tables 3-2** and **3-3** refer to specific 'acoustic periods' applicable to the DNL metric used for airfield noise impact analysis and correspond to 7 a.m.–10 p.m. (0700–2200) for daytime and 10 p.m.–7 a.m. (2200–0700) for DNL nighttime. The following subsections provide additional details for each category of aircraft.

Table 3-1 Existing Annual Operations Modeled at MCBH Kaneohe Bay

Agency	*A/C*	*A/C Type Modeled*	*Operations*			
			Arrivals	*Departures*	*Closed Patterns*	*Total*
USMC	C-130J	C-130J	660	660	3,960	5,280
Navy	C-20G	GIV	853	853	348	2,054
USMC	MH-60R	SH60B	1,788	1,788	3,784	7,360
USMC	MQ-9	CESSNA 441	1,500	1,500	0	3,000
USMC	MV-22B	MV-22B	4,820	4,820	4,594	14,234
Navy	P-8A	B-737-700	142	142	0	284
DoD	Transient	Various	3,334	3,334	0	6,668
TOTAL			13,097	13,097	12,686	38,880

Legend: A/C = aircraft; DoD = Department of Defense; MCBH = Marine Corps Base Hawaii; USMC = United States Marine Corps

3.1.1.1 USMC and Navy

MCBH Kaneohe Bay is home to four USMC and two Navy aviation assets. USMC aviation units include the following: Marine Air Refueler and Transport Squadron (VMGR) 153 operating C-130J aircraft; Marine Unmanned Aerial Vehicle Squadron (VMU) 3 operating MQ-9 aircraft; and Marine Medium Tiltrotor Squadron (VMM) 268 and 363 operating MV-22B aircraft. Navy aviation units include the Navy Headquarters Squadron operating C-20G aircraft; Helicopter Maritime Strike Squadron (HSM) 37 operating MH-60R aircraft, and Patrol Squadron (VP) 4 operating P-8A aircraft. With 260 weekdays per year and after accounting for holidays and weather, results in the following annual sorties (Navy 2022)

- C-130J, 660 sorties
- C-20G, 853 sorties
- MH-60R, 1,788 sorties
- MQ-9, 1,500 sorties
- MV-22B, 4,820 sorties
- P-8A, 142 sorties

Table 3-2 details annual aircraft operations and is further broken down by acoustic periods. Each sortie generates one departure, one arrival, and closed pattern events count as two tower operations.

Table 3-2 Existing Based Aircraft Annual Airfield Operations at MCBH Kaneohe Bay

A/C	*A/C Type Modeled*	*Navy/USMC*	*Total Operations*				
			Day	*% Day*	*Night*	*%Night*	*Total*
C-130J	C-130J	VMGR 153	5,207	99%	73	01%	5,280
C-20G	GIV	Headquarters Squadron	1,995	97%	59	03%	2,054
MH-60R	SH60B	HSM 37	6,872	93%	488	07%	7,360
MQ-9	CESSNA 441	VMU 3	2,805	94%	195	06%	3,000
MV-22B	MV-22B	VMM 268 & 363	13,772	97%	462	03%	14,234
P-8A	B-737-700	VP 4	282	99%	2	01%	284
TOTAL			30,933	96%	1,279	4%	32,212

Legend: % = percent; A/C = Aircraft; HSM= Helicopter Maritime Strike Squadron; MCBH = Marine Corps Base Hawaii; USMC = United States Marine Corps; VP = Patrol Squadron; VMGR = Marine Air Refueler and Transport Squadron; VMM = Marine Medium Tiltrotor Squadron; VMU = Marine Unmanned Aerial Vehicle Squadron

3.1.1.2 Transient Military

Table 3-3 details transient military aircraft operations totaling 6,668 per year based upon most recent agency input and air traffic control tower counts (Department of the Navy 2022). These flight operations are anticipated to remain the same when carried forward to the Preferred Alternative.

Table 3-3 Transient Military Operations at MCBH Kaneohe Bay

Aircraft	*A/C Type Modeled*	*Agency*	*Total Operations*				
			Day	*% Day*	*Night*	*% Night*	*Total*
Transients	Various	DoD	6,668	100%	0	0%	6,668

Legend: % = percent; A/C = aircraft; MCBH = Marine Corps Base Hawaii

3.1.2 Runway and Acoustic Time of Day Operations

Table 3-4 shows runway utilization and time of day operations for all aircraft operating at MCBH Kaneohe Bay.

3.1.3 Maintenance and Ground Run-up Operations

This section provides the existing ground runup operations as listed in **Table 3-5** with each location depicted in **Figure 3-1** for the existing conditions. All maintenance and ground run-up operations are anticipated to remain the same when carried forward to the Preferred Alternative. The exception being the reduction of C-20G operations and the introduction of C-40A aircraft operations. C-40A static and maintenance operations would occur in identical locations to the C-20G aircraft static and maintenance operations.

Table 3-4 Runway and Acoustic Time of Day Operations

Runway 04										
Aircraft	***Aircraft Type Modeled***	***Arrivals***			***Departures***			***Closed Patterns***		
		% Runway 04	***% Day***	***% Night***	***% Runway 04***	***% Day***	***% Night***	***% Runway 04***	***% Day***	***% Night***
C-130J	C-130J	93%	96%	4%	93%	99%	1%	93%	99%	1%
C-20G	GIV	98%	97%	3%	98%	97%	3%	55%	100%	0%
MH-60R	SH60B	77%	75%	25%	100%	95%	5%	23%	95%	5%
MQ-9	CESSNA 441	93%	88%	12%	93%	99%	1%	N/A	N/A	N/A
MV-22B	MV-22B	88%	92%	8%	93%	99%	1%	25%	99%	1%
P-8A	B-737-700	93%	99%	1%	93%	99%	1%	N/A	N/A	N/A
Transient	Various	93%	100%	0%	93%	100%	0%	93%	100%	0%
Overall		88%	90%	10%	89%	98%	2%	46%	99%	1%
Runway 22										
A/C	***A/C Type Modeled***	***Arrivals***			***Departures***			***Closed Patterns***		
		% Runway 22	***% Day***	***% Night***	***% Runway 22***	***% Day***	***% Night***	***% Runway 22***	***% Day***	***% Night***
C-130J	C-130J	7%	96%	4%	7%	99%	1%	7%	99%	1%
C-20G	GIV	2%	97%	3%	2%	97%	3%	45%	96%	4%
MH-60R	SH60B	23%	75%	25%	0%	0%	0%	77%*	99%*	1%*
MQ-9	CESSNA 441	7%	88%	12%	7%	99%	1%	N/A	N/A	N/A
MV-22B	MV-22B	12%	92%	8%	7%	99%	1%	75%^	99%^	1%^
P-8A	B-737-700	7%	99%	1%	7%	99%	1%	N/A	N/A	N/A
Transient	Various	7%	100%	0%	7%	100%	0%	7%	100%	0%
Overall		12%	84%	16%	11%	99%	1%	54%	99%	1%

Notes: Transient aircraft includes all transient military aircraft; * = represents operations at Westfield; ^ = represents operations at CALA and Westfield

Legend: % = percent; A/C = aircraft; CALA = Combat Aircraft Loading Area; N/A = Not Applicable

Table 3-5 Maintenance and Ground Run-up Operations at MCBH Kaneohe Bay

Aircraft Engine	*Long Name*	*Pad*	*Heading*	*Power*	*Number Day*	*Number Night*	*Duration (seconds)*	*Number Engines*
KC-130J AE2100D3	High Power Maintenance Run	HP	0	560 MGT	.109589	.005479	600	4
				970 MGT	.109589	.005479	2700	4
				820 MGT	.109589	.005479	1200	4
	B & B Wash	Wash Rack	5	560 MGT	.07397	.005479	600	4
	Low Power	C Ramp	320	600 MGT	2.08	0.11	900	1
	Preflight Runup	Hov/SL_1	40	840 MGT	1.95616	0.19178	120	4
C-20 SPEYMK511-8	Low Power	C20_park	40	500 LBS	.105205	.0263014	1800	2
	High Power Turns	HP	40	11400 LBS	.0312328	.0016438	900	2
MH-60R T700-CE-700	1 P101	P101	30	Ige Lite	0.1808	0.0059	1200	2
	2 Westfield Hover	P101	230	Ige Lite	0.0037	0.001	1200	2
	3 Westfield Hover	WF	30	Ige Lite	0.1808	0.0059	1200	2
	4 Westfield Hover	WF	230	Ige Lite	0.0037	0.001	1200	2
	5 Wash	Wash Rack	5	Idle	1.82466	0.2027	450	2
MV-22B (CH-53E surrogate) T64-GE-416A	SMT Ops Line 1	V22 Line 1	310	Ground Idle	2.0868	0.0	1200	2
				Ground Idle	4.1735	0.0	1800	2
	SMT Ops Line 2	V22 Line 2	310	Ground Idle	2.0868	0.0	1200	2
				Ground Idle	4.1735	0.0	1800	2
	SMT Ops Pits	Pits	180	Ground Idle	10.43	0.0	900	2
P-8 (737 surrogate) JT8D-9A	Engine Runs	P-8 Park	310	2000 LBS	0.04931	0.0	600	2
	SMT Ops	P-8 Park	310	1000 LBS	0.389	0.0	600	2

Legend: MCBH = Marine Corps Base Hawaii; SMT = Search and Rescue Medical Technician

Figure 3-1 Static Locations at MCBH Kaneohe Bay

3.2 NOISE EXPOSURE

Sections 3.2.1 and 3.2.2 discuss DoD best practices for impact analysis, as summarized in DNWG guidance (DNWG 2009).

3.2.1 Day-Night Average Sound Level Contours and Point of Interest Levels

Figure 3-2 shows the DNL noise contours from 65 to 85 dB in 5-dB increments for the existing conditions at MCBH Kaneohe Bay. Noise generated from aircraft operations at MCBH Kaneohe Bay occurs both within and outside the airfield. Portions of the 65 dB DNL contour extends east and west of the base boundary by approximately 1.5 and 2.0 miles, respectively. Approximately 1,887 acres exist beyond the base boundary at the noise level of 65 DNL and above. **Table 3-6** shows representative acreage within each DNL noise contour on- and off-base.

Table 3-6 Existing Noise Exposure Acreage in the Vicinity of MCBH Kaneohe Bay

DNL (dB)	*Existing/No Action Acreage*		
	On Base	*Off-Base*	*Total*
65–70	779	1,277	2,056
70–75	470	431	901
75–80	302	142	444
80–85	163	32	195
85+	40	5	45
Total >65 dB	**1,754**	**1,887**	**3,641**

Legend: > = greater than; dB = decibel; DNL = Day-Night Average Sound Level; MCBH = Marine Corps Base Hawaii

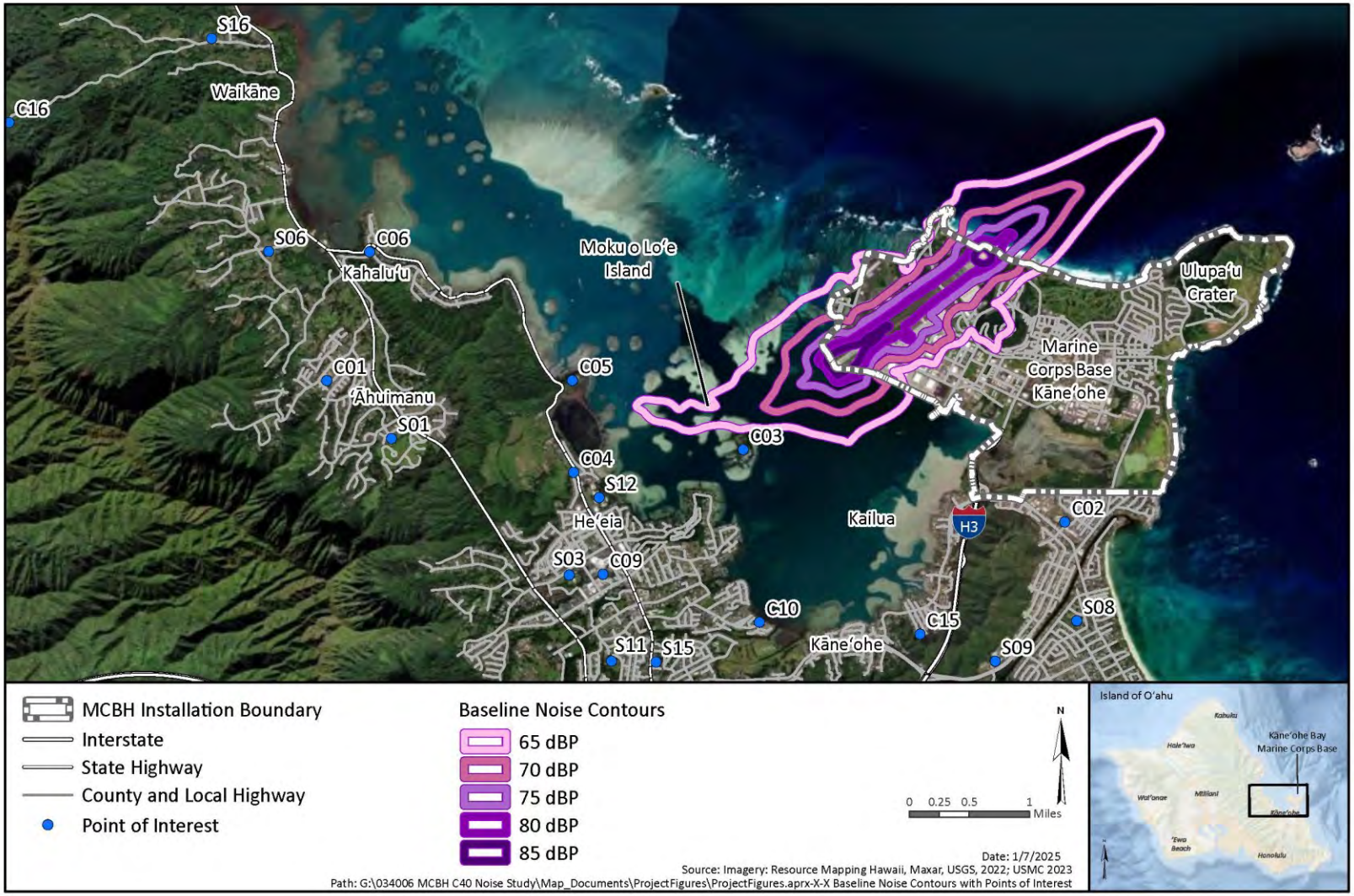

Figure 3-2 Existing DNL Contours and Points of Interest in the Vicinity of MCBH Kaneohe Bay

Table 3-7 shows the DNL values at each of the POIs under the existing conditions. Values range from 28 to 59 dB DNL for sensitive receptors, thus, no residential areas, schools, or hospitals are currently exposed to 65 dB DNL or greater, which is the DoD threshold for land use recommendations for noise sensitive land uses.

Table 3-7 Existing Conditions at POIs Noise Exposure in the Vicinity of MCBH Kaneohe Bay

Map ID	*Point Type*	*Named POI*	*Existing/No Action Alternative (dB DNL)*
C01	Community	ʻĀhuimanu	33
C02	Community	ʻAikahi Community Park	43
C03	Community	Coconut Island (Moku-o-loe)	59
C04	Community	Heʻieia	48
C05	Community	Heʻieia State Park	59
C06	Community	Kahuluʻu	39
C07	Community	Kailua	31
C08	Community	Kalama Beach Park	34
C09	Community	Kāneʻohe	42
C10	Community	Kāneʻohe Beach Park	50
C11	Community	Kualoa	37
C12	Community	Kualoa Beach Park	37
C13	Community	Lanilkai	30
C14	Community	Maunawili	32
C15	Community	Oneawa Hills	50
C16	Community	Waiahole	28
C17	Community	Waikāne	34
S01	School	ʻĀhuimanu Elementary School	37
S02	School	Enchanted Lake Elementary School	31
S03	School	Heʻeia Elementary School	42
S04	School	James B. Castle High School	38
S05	School	Kaʻohao Public Charter School	31
S06	School	Kahaluʻu Elementary School	34
S07	School	Kailua Intermediate School	31
S08	School	Kainalu Elementary School	36
S09	School	Kalāheo High School	37
S10	School	Kāneʻohe Elementary School	39
S11	School	Kapunahala Elementary School	39
S12	School	S.W. King Intermediate School	49
S13	School	Maunawili Elementary School	32
S14	School	Olomana School	31
S15	School	Saint Mark Elementary School	39
S16	School	Waiahole Elementary School	33

Legend: dB = decibel; DNL = Day-Night Average Sound Level; ID = Identification; MCBH = Marine Corps Base Hawaii; POI = Point of Interest

3.2.2 Sound Exposure Level and Point of Interest Levels

Table 3-8 lists the maximum SEL values at each of the POIs under the existing conditions. Values range from 72 to 110 dB SEL for sensitive receptors. The values presented are predominately based on transient military fighter aircraft departures and occur infrequently.

Table 3-8 Existing Conditions SEL Values at POIs Noise Exposure in the Vicinity of MCBH Kaneohe Bay

Map ID	*Point Type*	*Named POI*	*SEL (dB)*	*Source (Category, A/C Runway, Operation)*
C01	Community	ʻĀhuimanu	86	T_F18EF_22_DEP
C02	Community	ʻAikahi Community Park	90	T_F18EF__04_DEP
C03	Community	Coconut Island (Moku-o-loe)	110	T_F18EF__22_DEP
C04	Community	Heʻieia	98	T_F18EF_22_DEP
C05	Community	Heʻieia State Park	110	T_F18EF_04_ARR
C06	Community	Kahuluʻu	92	T_F18EF_22_DEP
C07	Community	Kailua	74	T_F22_22_DEP
C08	Community	Kalama Beach Park	82	T_F18EF_04_DEP
C09	Community	Kāneʻohe	91	T_F22_22_DEP
C10	Community	Kāneʻohe Beach Park	100	T_F18EF_04_DEP
C11	Community	Kualoa	85	T_F18EF_22_DEP
C12	Community	Kualoa Beach Park	86	T_F18EF_22_DEP
C13	Community	Lanilkai	75	T_F35B_04_DEP
C14	Community	Maunawili	78	T_F18EF_04_DEP
C15	Community	Oneawa Hills	97	T_F22_04_DEP
C16	Community	Waiahole	73	T_F18EF_22_DEP
C17	Community	Waikāne	81	B_C130J_04_DEP
S01	School	ʻĀhuimanu Elementary School	88	T_F18EF_22_DEP
S02	School	Enchanted Lake Elementary School	80	T_F18EF_04_DEP
S03	School	Heʻeia Elementary School	90	T_F22_22_DEP
S04	School	James B. Castle High School	85	T_F22_22_DEP
S05	School	Kaʻohao Public Charter School	72	T_F22_04_DEP
S06	School	Kahaluʻu Elementary School	85	T_F18EF_22_DEP
S07	School	Kailua Intermediate School	73	T_F22_04_DEP
S08	School	Kainalu Elementary School	81	T_F18EF_04_DEP
S09	School	Kalāheo High School	78	T_F18EF_04_DEP
S10	School	Kāneʻohe Elementary School	86	T_F18EF_04_DEP
S11	School	Kapunahala Elementary School	86	T_F22_22_DEP
S12	School	S.W. King Intermediate School	97	T_F18EF_22_DEP
S13	School	Maunawili Elementary School	78	T_F18EF_04_DEP
S14	School	Olomana School	78	T_F18EF_04_DEP
S15	School	Saint Mark Elementary School	86	T_F22_22_DEP
S16	School	Waiahole Elementary School	82	T_F18EF_22_DEP

Legend: ARR = Arrival; A/C = Aircraft; B = Based; dB = decibel; DEP = Departure; SEL = Sound Exposure Level; ID = Identification; POI = Point of Interest; T = Transient

4.0 PROPOSED ACTION

The following section details the modeling data and the resultant noise exposure for the beddown of the C-40A aircraft as described in Section 1.1. All aircraft flight and maintenance operations not associated with the C-20G aircraft would remain as described in Section 3.0, *Existing Conditions*.

4.1 MODELING DATA

Annual flight operations, maintenance and static operations, closed pattern altitudes, and flight tracks not associated with C-20G aircraft would remain as described under existing conditions. Regarding noise modeling inputs, the following would change when compared to the existing conditions.

- C-20G flight, maintenance and static operations would be reduced by 50 percent to accommodate the reduction in C-20G aircraft from 2 to 1.
- C-40A flight, maintenance and static operations would be introduced and operate along the same flight tracks as C-20G aircraft.
- C-40A aircraft would complete 113 sorties annually.

Preferred Alternative conditions would comprise a total of 38,119 flight operations at MCBH Kaneohe Bay with 1,744 operations occurring during the DNL nighttime period, as summarized in **Tables 4-1, 4-2,** and **4-3**. The day and night periods in **Tables 4-2** and **4-3** refer to specific 'acoustic periods' applicable to the DNL metric used for airfield noise impact analysis and correspond to 7 a.m.–10 p.m. (0700–2200) for daytime and 10 p.m.–7 a.m. (2200–0700) for DNL nighttime. The following subsections provide additional details for each category of aircraft.

Table 4-1 Proposed Action Annual Operations Modeled at MCBH Kaneohe Bay

Agency	*A/C*	*A/C Type Modeled*	*Operations*			
			Arrivals	*Departures*	*Closed Patterns*	*Total*
USMC	C-130J	C-130J	660	660	3,960	5,280
USMC	C-20G	GIV	427	427	174	1,027
Navy	C-40A	B-737-700	113	113	40	266
USMC	MH-60R	SH60B	1,788	1,788	3,784	7,360
USMC	MQ-9	CESSNA 441	1,500	1,500	0	3,000
USMC	MV-22B	MV-22B	4,820	4,820	4,594	14,234
Navy	P-8A	B-737-700	142	142	0	284
DoD	Transient	Various	3,334	3,334	0	6,668
TOTAL			12784	12784	12,552	38,119

Legend: A/C = aircraft; DoD = Department of Defense; USMC = United States Marine Corps

Table 4-2 details C-40A annual aircraft operations and is further broken down by acoustic periods. Each sortie generates one departure, one arrival, and closed pattern events count as two tower operations. All other aircraft operations at MCBH Kaneohe Bay would remain as described under Existing Conditions.

Table 4-2 Proposed Action Time of Day Aircraft Annual Airfield Operations at MCBH Kaneohe Bay

A/C	*A/C Type Modeled*	*Navy/USMC*	*Total Operations*				
			Day	*%Day*	*Night*	*%Night*	*Total*
C-40A	B-737-700	VMGR 153	259	97%	7	3%	266

Legend: % = percent; A/C = aircraft; MCBH = Marine Corps Base Hawaii; USMC = United States Marine Corps; VMGR = Marine Air Refueler and Transport Squadron

4.1.1 Runway and Acoustic Time of Day Operations

Table 4-3 shows C-40A runway utilization and time of day operational percentages at MCBH Kaneohe Bay. Aircraft utilization and time of day operational percentages would remain as described under Existing Conditions for all other aircraft at MCBH Kaneohe Bay.

4.1.2 Maintenance and Ground Run-up Operations

All maintenance and ground run-up operations are anticipated to remain the same when carried forward to the Preferred Alternative. The exception being the reduction of C-20G operations and the introduction of C-40A aircraft operations presented in **Table 4-4.**

Table 4-3 Proposed Action Runway and Acoustic Time of Day Operations

Runway 04										
Aircraft	*A/C Type Modeled*	*Arrivals*			*Departures*			*Closed Patterns*		
		% Runway 04	*% Day*	*% Night*	*% Runway 04*	*% Day*	*% Night*	*% Runway 04*	*% Day*	*% Night*
C-40A	B-737-700	93%	96%	4%	93%	99%	1%	93%	99%	1%
Runway 22										
A/C	*A/C Type Modeled*	*Arrivals*			*Departures*			*Closed Patterns*		
		% Runway 22	*% Day*	*% Night*	*% Runway 22*	*% Day*	*% Night*	*% Runway 22*	*% Day*	*% Night*
C-40A	B-737-700	7%	96%	4%	7%	99%	1%	7%	99%	1%

Legend: # = Military transients do no complete closed patterns; % = percent; A/C = aircraft

Table 4-4 Proposed Action Maintenance and Ground Run-up Operations at MCBH Kaneohe Bay

Aircraft Engine	*Long Name*	*Pad*	*Heading*	*Power*	*Number Day*	*Number Night*	*Duration (seconds)*	*Number Engines*
C-20G SPEYMK511-8	High Power Turns	HP	40	11,400 LBS/HR	0.015615	0.0008	900	2
	Low Power	C20_Park	40	500 LBS/HR	0.0526	0.01315	1800	2
C-40A	Engine Runs	C40_Park	50	2,000 LBS/HR	0.01096	0	600	1
C-9A surrogate JT8D-9A	SMT Operations	C40_Park	50	1,000 LBS/HR	0.3096	0	735	2

Legend: LBS/HR = pounds per hour; MCBH = Marine Corps Base Hawaii; SMT = Search and Rescue Medical Technician

4.2 NOISE EXPOSURE

Section 4.2.1 presents the DNL analysis and Section 4.2.2 discusses the single-event SELs, as recommended in DNWG guidance (DNWG 2009). Additionally, single event SELs associated with C-20G and C-40A aircraft are included for comparison.

4.2.1 Day-Night Average Sound Level Contours and Point of Interest Levels

Figure 4-1 shows the DNL noise contours from 65 to 85 dB in 5-dB increments for implementation of the Preferred Alternative. As with the Existing/No Action Alternative, noise generated by aircraft operations at MCBH Kaneohe Bay would occur both within and outside of the airfield. Similar to Existing Conditions, the 65 dB DNL contour extends east and west of the base boundary by approximately 1.5 and 2.0 miles, respectively. Implementation of the Preferred Alternative would result in a reduction of 8 acres beyond the base boundary at the noise level of 65 dB DNL and above when compared to Existing/No Action Alternative. **Table 4-5** shows the acreage within each DNL noise contour off base and the difference in acreage when comparing the Existing/No Action Alternative to the Preferred Alternative.

Table 4-5 Proposed Action Noise Exposure Acreage in the Vicinity of MCBH Kaneohe Bay

DNL (dB)	*Existing/No Action Off-base Acreage*	*Preferred Alternative Off-base Acreage*	*Difference Off-base Acreage*
65–70	1,277	1,271	-6
70–75	431	429	-2
75–80	142	142	0
80–85	32	32	0
85+	5	5	0
Total >65 dB	**1,887**	**1,879**	**-8**

Legend: > = greater than; dB = decibel; DNL = Day-Night Average Sound Level; MCBH = Marine Corps Base Hawaii

Figure 4-1 Proposed Action DNL Noise Contours and Points of Interest in the Vicinity of MCBH Kaneohe Bay

Table 4-6 shows the DNL values at each of the POIs under the existing conditions. Values range from 28 to 59 dB DNL for sensitive receptors, thus, no residential areas, schools, or hospitals are currently exposed to 65 dB DNL or greater, which is the DoD threshold for land use recommendations for noise sensitive land uses. There would not be any increase in DNL values at representative POIs when comparing the Existing/No Action Alternative to the Preferred Alternative.

Table 4-6 DNL at POIs under the Preferred Alternative in the Vicinity of MCBH Kaneohe Bay

Map ID	*Point Type*	*Named POI*	*Existing/No Action Alternative*	*Proposed Action*
C01	Community	ʻĀhuimanu	33	33
C02	Community	ʻAikahi Community Park	43	43
C03	Community	Coconut Island (Moku-o-loe)	59	59
C04	Community	Heʻieia	48	48
C05	Community	Heʻieia State Park	59	59
C06	Community	Kahuluʻu	39	39
C07	Community	Kailua	31	31
C08	Community	Kalama Beach Park	34	34
C09	Community	Kāneʻohe	42	42
C10	Community	Kāneʻohe Beach Park	50	50
C11	Community	Kualoa	37	37
C12	Community	Kualoa Beach Park	37	37
C13	Community	Lanilkai	30	30
C14	Community	Maunawili	32	32
C15	Community	Oneawa Hills	50	48 (-2)
C16	Community	Waiahole	28	28
C17	Community	Waikāne	34	34
S01	School	ʻĀhuimanu Elementary School	37	37
S02	School	Enchanted Lake Elementary School	31	31
S03	School	Heʻeia Elementary School	42	42
S04	School	James B. Castle High School	38	38
S05	School	Kaʻohao Public Charter School	31	31
S06	School	Kahaluʻu Elementary School	34	34
S07	School	Kailua Intermediate School	31	31
S08	School	Kainalu Elementary School	36	36
S09	School	Kalāheo High School	37	37
S10	School	Kāneʻohe Elementary School	39	39
S11	School	Kapunahala Elementary School	39	39
S12	School	S.W. King Intermediate School	49	49
S13	School	Maunawili Elementary School	32	32
S14	School	Olomana School	31	31
S15	School	Saint Mark Elementary School	39	39
S16	School	Waiahole Elementary School	33	33

Legend: (x) = difference from Existing/No Action to Preferred Alternative; DNL = Day-Night Average Sound Level; ID = Identification; MCBH = Marine Corps Base Hawaii; POI = Point of Interest

4.2.2 Sound Exposure Level and Point of Interest Levels

Maximum SELs under the Preferred Alternative would be identical to SELs presented under the Existing/No Action Alternative at respective POIs. Transient military fighter aircraft departures would continue to be the primary contributor and occur infrequently.

Table 4-7 shows the maximum SEL values for arrival, departure, and closed pattern operations for both the C-20G and C-40A aircraft at each of the POIs.

Table 4-7 C-20G and C-40A SEL Values (dB) at POIs Noise Exposure in the Vicinity of MCBH Kaneohe Bay

Map ID	*Named POI*	*Departure*		*Arrival*		*Closed Pattern*	
		C-20G	*C-40A*	*C-20G*	*C-40A*	*C-20G*	*C-40A*
C01	ʻĀhuimanu	68	71	58	60	40	47
C02	ʻAikahi Community Park	70	71	56	60	61	75
C03	Coconut Island (Moku-o-loe)	87	88	80	85	81	90
C04	Heʻieia	78	80	71	76	71	82
C05	Heʻieia State Park	84	86	84	87	77	86
C06	Kahuluʻu	72	75	65	69	62	72
C07	Kailua	61	60	45	45	45	59
C08	Kalama Beach Park	62	62	50	50	56	70
C09	Kāneʻohe	72	74	64	68	65	77
C10	Kāneʻohe Beach Park	73	75	63	68	70	79
C11	Kualoa	67	69	55	61	56	63
C12	Kualoa Beach Park	68	70	56	62	57	65
C13	Lanilkai	56	52	49	48	50	60
C14	Maunawili	60	59	39	39	41	52
C15	Oneawa Hills	72	73	60	64	69	78
C16	Waiahole	60	60	49	56	47	54
C17	Waikāne	65	73	54	60	55	63
S01	ʻĀhuimanu Elementary School	70	69	61	53	55	71
S02	Enchanted Lake Elementary School	58	56	44	42	44	51
S03	Heʻeia Elementary School	72	73	63	67	65	76
S04	James B. Castle High School	68	69	57	60	59	71
S05	Kaʻohao Public Charter School	59	62	49	48	52	61
S06	Kahaluʻu Elementary School	68	70	59	65	57	68
S07	Kailua Intermediate School	60	67	47	47	47	57
S08	Kainalu Elementary School	63	62	50	52	51	67
S09	Kalāheo High School	57	41	37	38	33	42
S10	Kāneʻohe Elementary School	66	67	54	57	59	68
S11	Kapunahala Elementary School	68	70	58	63	61	72
S12	S.W. King Intermediate School	78	80	70	75	71	82
S13	Maunawili Elementary School	59	57	38	37	42	50
S14	Olomana School	57	56	36	34	42	46
S15	Saint Mark Elementary School	69	71	59	63	61	73
S16	Waiahole Elementary School	66	67	55	62	55	64

Legend: dB = decibel; ID = Identification; MCBH = Marine Corps Base Hawaii; POI = Point of Interest; SEL = Sound Exposure Level

5.0 NO ACTION ALTERNATIVE

5.1.1 Modeling Data and Noise Exposure

The No Action Alternative represents the condition that corresponds to the same period in time as the proposed alternative after the completion of the proposed action. All aircraft operations, including maintenance and ground run-up operations at MCBH Kaneohe Bay would remain as described under the existing conditions and there would be no airfield improvements. Therefore, overall noise exposure and POI Noise Levels would remain as described in Section 3.0, *Existing Conditions*.

6.0 REFERENCES

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