NEPA Action EA/EIS
Publication Form

Project Name: Water Reclamation Facility Upgrade Marine Corps Base Hawaii -- Final Environmental Assessment (EA) an Finding of No Significant Impact (FONSI)

Island: O'ahu
District: Kāneʻohe Bay and Kailua Bay
TMK:
Permits: National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (MS4) permit.
Applicant or Proposing Agency: Marine Corps Base Hawaii
Maj Thomas Santos, (808) 272-5549, thomas.e.santos.civ@usmc.mil
Approving Agency: Naval Facilities Engineering Systems Command, Southwest
Ryan Maynard, (619) 705-5556, ryan.m.maynard4.civ@us.navy.mil

Consultant: Stantec; 737 Bishop Street, Suite 3050, Honolulu HI 96813
Peer Amble, (805) 570-1313, peer.amble@cardno-gs.com

Status: The Marine Corps solicited public and agency input on the Draft EA from April 8 – May 8, 2025 through publication of a Draft EA and through the National Historic Preservation Act Section 106 consultation process. Public comments were considered as part of the decision-making process as identified in Appendix B of the EA. A printed copy of the Final EA-FONSI is available at the Hawaii Documents Center (Hawaii State Public Library) and at the following libraries on O'ahu: Kailua Public Library and Kāneʻohe Public Library. A copy of the Final EA-FONSI is located at the following websites: https://planning.hawaii.gov/erp and the MCB Hawaii website: https://www.mcbhawaii.marines.mil/Offices-and-Staff/Environmental/#tab/environmental-evaluations.

Summary: The purpose of the proposed action aims to eliminate non-compliant discharges during planned maintenance events unexpected repairs by upgrading the existing infrastructure and building a redundant system with a capacity equivalent to the current Water Reclamation Facility (WRF). The upgraded facility would introduce new water reuse capabilities on base and be designed to meet tsunami resilience standards. Additionally, the improvements would enhance the quality of treated effluent to R-1 standards, allowing reclaimed water to be used for on-base irrigation, thereby reducing overall water demand and diverting up to 1 million gallons per day from the ocean outfall. Construction would be carried out in phases to minimize disruptions and ensure continuous operation of the WRF. The proposed construction would occur on previously disturbed areas and undeveloped landscaped areas within the existing WRF footprint. No modifications to the ocean outfall would occur under the proposed action, and there would be no increase in total discharge quantities. The upgraded WRF would operate just like the existing WRF.

Revised February 2012

Final
ENVIRONMENTAL ASSESSMENT
for
WATER RECLAMATION FACILITY UPGRADE
MARINE CORPS BASE HAWAII
O‘AHU, HAWAI‘I

UID#: EAXX-007-17-XMC-1734030998

July 2025

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DEPARTMENT OF DEFENSE
United States Marine Corps

FINDING OF NO SIGNIFICANT IMPACT FOR WATER RECLAMATION FACILITY UPGRADE AT MARINE CORPS BASE HAWAII, O'AHU, HAWAI'I

In accordance with the National Environmental Policy Act (NEPA) (42 United States [U.S.] Code [U.S.C.] sections 4321, et seq.) Department of Defense National Environmental Policy Act Implementing Procedures (June 30, 2025), and Marine Corps Order 5090.2, the U.S. Marine Corps gives notice that an Environmental Assessment (EA) has been prepared and, based on the analysis contained in the EA, an Environmental Impact Statement (EIS) need not be prepared to upgrade the Water Reclamation Facility (WRF) at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The EA advances NEPA's purpose to inform decision-makers and the public about the potential environmental effects of the proposed action. The Final EA is incorporated by reference into this Finding of No Significant Impact (FONSI).

The EA analyzed the upgrades to the WRF at MCBH Kaneohe Bay. Major project elements included adding additional redundancy capabilities to the WRF, renovation and construction of support facilities, improving security around the WRF, increasing utility service capabilities at the WRF, and incorporating tsunami designs to account for sea level rise. The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system equal to the capacity of the existing facility. The proposed action, designed to meet water quality and disinfection permit standards, would also provide new water reuse capabilities on base. The proposed action is needed to provide treatment processes that will ensure compliance with MCBH's National Pollutant Discharge Elimination System wastewater permit and resolve outstanding deficiencies. This FONSI memorializes the finding that the proposed action, as described in Section 2.1 of the EA, will not have a significant impact on the quality of the environment.

Agency Coordination and Public Involvement: Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps conducted formal and informal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding potential effects to ESA-listed species. In September 2024, the Marine Corps prepared a Final Biological Assessment (BA) (Appendix D) initiating consultation with USFWS, Pacific Islands Office, under Section 7 of the ESA. The BA concluded the proposed action would disturb Hawaiian Stilts and would require deterrence and hazing efforts during construction and operation of the WRF to prevent injury or death to Stilts, and thus "will affect" the Hawaiian Stilt. Following formal consultation, on March 28, 2025, the USFWS issued its Biological Opinion concluding that while "all eggs of chicks associated with up to 2 [stilt] nests every 5 years may be taken ... it is the Service's biological opinion that the WRF upgrade, as proposed, is not likely to jeopardize the continued existence of the [stilt]." . In accordance with Section 106 of the National Historic Preservation Act, the Marine Corps coordinated with the Hawai'i State Historic Preservation Officer (SHPO), Native Hawaiian Organizations, interested parties, and the public regarding a finding of no historic properties affected by the proposed action. The SHPO concurred with this finding with the provision that the Marine Corps will provide the SHPO with an archaeological monitoring report following completion of archaeological monitoring (Appendix C). Regarding consistency with the Coastal Zone Management Act (CZMA), the proposed action falls under the "Navy/Marine Corps De Minimis Activities List Under CZMA." The Marine Corps notified the State of Hawai'i Office of Planning and Sustainable Development, Planning Division, regarding its determination on January 8, 2025. On February 12, 2025, the Planning Division

acknowledged that the proposed activities are not subject to further review by the Hawai'i Coastal Zone Management Program because the listed activities are subject to and bound by full compliance with the "Project Mitigation/General Conditions."

The Marine Corps solicited public and agency input on the Draft EA from April 8 to May 8, 2025. The Marine Corps published a notice of availability for the review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. Printed copies were also available for viewing at the Hawai'i Documents Center (Hawai'i State Public Library) and at the following libraries on O'ahu: Kailua Public Library and Kāne'ohe Public Library. Prior to the release of the Draft EA, MCBH Public Affairs Officers coordinated with the local community at monthly neighborhood board meetings and other public meetings about the proposed action and the Draft EA public comment period. Three comments were received and were individually addressed in Appendix B, Public Comments and Responses. Additionally, comments received outside this formal comment period, such as through the Section 106 consultation process, were considered in the development of the Final EA. All comments received were fully considered by the Marine Corps prior to rendering a decision on the proposed action.

Summary of Environmental Effects: The EA analysis focuses on the potential resources most affected by the proposed action (Final EA, Section 3.1), considering the context and intensity of the effects potentially associated with the action. The Final EA did not identify any significant effects to the human environment resulting from the proposed action (Final EA, Table S.4-1, Summary of Potential Effects). The proposed action would have less than significant effects to the resource categories analyzed in detail in the Final EA: noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation.

The proposed action would result in less than significant noise effects during both the construction and operations phases of the WRF. Intermittent increases in noise are expected during construction and renovation activities due to the use of heavy equipment, power tools, hand tools, and construction vehicles. However, these activities would occur entirely within the existing operational footprint of the WRF, an area already exposed to and generating industrial noise. Additionally, the new equipment and facilities would be located within the current WRF boundaries and would be similar in type and function to existing infrastructure, producing comparable noise levels.

Construction activities associated with the proposed action would result in short-term, temporary air emissions, including fugitive dust and exhaust from the combustion of fossil fuels by construction equipment. However, prevailing northeast trade winds help disperse air pollutants, reducing potential effects. In addition, best management practice (BMPs), such as regular watering to control dust and the temporary nature of construction, combined with the distance to sensitive downwind receptors (approximately 0.5 to 0.6 miles away), would further reduce the effect of ground-level emissions. Overall, the implementation of BMPs and the limited duration of construction would result in less than significant effects to air quality. During operations, the upgraded WRF would produce stationary source emissions similar to those of the existing facility, maintaining consistency with current air quality conditions.

The proposed construction at the WRF would not significantly affect water quality during the construction period. No construction would occur in the two wetlands adjacent to the WRF. Effects to groundwater and drinking water would also be less than significant. There are no potable water wells on the base, and the proposed ground-disturbing activities, covering approximately three acres, would primarily occur within previously disturbed areas of the existing WRF footprint. Additionally, the amount of impervious surface area created by the upgraded WRF would be comparable to current conditions, resulting in similar storm water drainage flows and volumes. The proposed improvements would also

enhance flood protection by being designed to meet tsunami resilience requirements. All construction activities are located outside of FEMA-designated floodplains. Once operational, the upgraded WRF would improve the quality and reduce the volume of wastewater discharged into the municipal outfall. It would not affect nearby wetlands or drinking water sources at MCBH Kaneohe Bay. Furthermore, the project would enable the reuse of R-1 quality water at the Klipper Golf Course, thereby reducing demand on the City and County of Honolulu Board of Water Supply and decreasing the amount of effluent discharged to the outfall.

The proposed action would have less than significant effects to cultural resources. There are no architectural resources withing the Area of Potential Effect (APE). Regarding archaeological resources, the APE is located in an area of filled land created in the 1940s with no potential for National Register of Historic Places eligible archaeological sites to be present. It is possible that human remains were brought into the project area with historic fill sand mined from the northern dunes (the Mōkapu Burial Area), so archaeological monitoring would occur during ground-disturbing activities consistent with Standard Operating Procedures 3, *Work in Archaeologically Sensitive Areas*, per the MCBH Integrated Cultural Resources Management Plan.

The proposed construction would result in the removal of over 70,000 square feet of landscaped area and vegetation along the WRF's perimeter fence line. No notable ecological communities are present in the proposed fence line area, along the communications duct bank trenching, or elsewhere within the region of influence (ROI). Site preparation and construction would involve clearing non-native trees, scrub, and landscaped grass in previously disturbed or maintained areas along the perimeter and eastern edge of the WRF. Vegetative restoration will be implemented in accordance with the MCBH Landscape Manual. To reduce potential effects to wildlife, deterrents would be employed during construction to discourage animals from entering active work zones. Habitat effects would be moderate, as the species currently present are generally mobile and can relocate to similar adjacent habitats. Wildlife temporarily displaced by construction would likely move to nearby areas, such as the Salvage Yard Wetland. While construction may introduce temporary stressors for special-status species in the ROI, these effects would be minimized through the implementation of BMPs and conservation measures. Based on the USFWS formula to determine potential bat take, the barbed wire fence would not result in a take during the life of the fence. Operation of the upgraded WRF would be similar to existing conditions and thus, may affect but is not likely to adversely affect wildlife and special-status species. The USFWS Biological Opinion concluded that the proposed action is not likely to jeopardize the continued existence of the Hawaiian Stilt and is not likely to adversely affect other ESA species.

The proposed construction and future WRF operation would have beneficial effects to utility services in the ROI. Personnel at MCBH would experience short-term disruptions in utility services during construction; however, the disruptions would be brief and temporary. Operation of the upgraded WRF would have beneficial effects, such as energy-efficient designs that save power and increase capacity to treat wastewater, and the upgraded WRF would provide the capability to reuse treated wastewater, thereby reducing overall potable water demand at the base.

Construction would have less than significant effects to transportation outside MCBH Kaneohe Bay. The Marine Corps estimates there would be approximately 68 additional vehicle trips per day entering and exiting the installation at the main gate during morning and afternoon peak periods, representing a 7% increase over normal conditions if all traffic were to occur in the same hour. While such an increase could cause minor delays in entering the base, it is similar to fluctuations that occur with other construction projects at MCBH Kaneohe Bay and are accommodated without affecting traffic on the H-3. Operation of the WRF would require the addition of five more personnel, a negligible increase in base personnel. As such, operation of the upgraded WRF would also have less than significant effects to transportation.

FINDING OF NO SIGNIFICANT IMPACT FOR WATER RECLAMATION FACILITY UPGRADE AT MARINE CORPS BASE HAWAII, O'AHU, HAWAI'I

Summary of Cumulative Effects: Cumulative effects to noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation would be less than significant for construction and operation of the WRF. The past, present, and future actions listed in Table 4.3-1 of the Final EA represent routine modernization activity on the installation and would not result in significant effects to the local population. The construction period of the proposed action would not represent a cumulatively significant effect when viewed in context of all reasonably foreseeable present and future projects due to the temporal and geographic sequencing of those projects. Future projects within these areas would consist principally of new and improved infrastructure in previously developed and disturbed areas and would not introduce new uses to MCBH Kaneohe Bay. Therefore, cumulative effects would be less than significant.

Finding: After careful review of the EA, the Marine Corps concludes that the proposed action will not result in significant effects to the quality of the human environment. This FONSI is based on the analysis contained in the attached EA, including the conservation measures and BMPs detailed throughout.

The EA addressing this proposed action may be obtained by downloading an electronic copy from the State of Hawai'i's Environmental Review Program website (https://planning.hawaii.gov/erp) and on the MCBH website (https://www.mcbhawaii.marines.mil/Offices-and-Staff/Environmental/#tab/environmental-evaluations).

20250814

J.W. BEAVEN
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Base Hawaii Kaneohe Bay

Date

Abstract

Designation:	**Environmental Assessment**
Title of Proposed Action:	**Water Reclamation Facility Upgrade**
Project Location:	**Marine Corps Base Hawaii (MCBH), O'ahu, Hawai'i**
Affected Region:	**City and County of Honolulu, O'ahu, Hawai'i**
Action Proponent:	**MCBH**
Point of Contact:	**NEPA Program Manager, MCBH** Email comments to: MCBH.WRF.EA@stantecgs.com or Mail comments to: Peer Amble Stantec GS Inc. 737 Bishop Street, Suite 3050 Honolulu HI, 96813
Unique ID #:	**EAXX-007-17-XMC-1734030998**
Date:	**July 2025**

The Marine Corps prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), Department of Defense National Environmental Policy Act Implementing Procedures (June 30, 2025), and Marine Corps Order 5090.2. The proposed action is to upgrade the existing Water Reclamation Facility (WRF) at Marine Corps Base Hawaii (MCBH) Kaneohe Bay and construct and operate a new redundant wastewater treatment system resulting in an overall upgraded WRF. The proposed action would allow the WRF to maintain full capacity during maintenance activities, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would occur at the existing WRF entirely within MCBH Kaneohe Bay. The proposed action would be constructed over a 3-year period. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF.

This EA evaluates the potential environmental effects of the proposed action to the following resources: noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation.

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Summary

S.1 Proposed Action

Marine Corps Base Hawaii (MCBH) Kaneohe Bay, on the island of O'ahu, Hawai'i, operates a Water Reclamation Facility (WRF) to treat wastewater at the base. The WRF uses a "single-train treatment process," meaning it cannot operate effectively when components are offline for repair or maintenance. This facility currently treats water in accordance with National Pollutant Discharge Elimination System (NPDES) permit HI0110078 (hereafter referred to as the "NPDES wastewater permit"). MCBH coordinates planned maintenance events with the Hawai'i State Department of Health (DOH). In order for MCBH to ensure compliance with its NPDES wastewater permit, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The proposed action would also improve the overall quality of the treated effluent to R-1 standards, reduce overall water demand from the City and County of Honolulu Board of Water Supply, and improve the WRF to meet tsunami design standards.

More specifically, the proposed action would create a redundant capability through the construction of additional WRF components, which would be integrated with and adjacent to the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events and for unscheduled repairs. The new WRF capability would allow existing and new unit processes to be removed from service for maintenance activities while still maintaining the ability to process and treat effluent. With the proposed upgrade and the new redundant system, the WRF would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the treated effluent, and implement tsunami design standards. While the upgrade would increase capacity to treat effluent at the WRF, there is no plan to increase the volume of water treated at the WRF. Figure S.1-1 shows the proposed project location at MCBH Kaneohe Bay, and Figure S.1-2 shows the proposed WRF upgrades.

S.2 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system equal to the capacity of the existing facility. The proposed action, designed to meet water quality and disinfection permit standards, would also provide new water reuse capabilities on base, and be constructed to meet tsunami design requirements. The proposed action is needed to provide treatment processes that will ensure compliance with MCBH's NPDES wastewater permit and resolve outstanding deficiencies.

S.3 Alternatives Considered

The Marine Corps implemented a design review process (Naval Facilities Engineering Systems Command [NAVFAC] Hawaii, 2024), which identified one reasonable alternative which meets the purpose and need of the proposed action. The Marine Corps considered and eliminated from detailed analysis new treatment technologies (to include use of membrane bioreactors and ultraviolet disinfection treatment) due to the complexities of operating such systems and their reliability and required maintenance. As such, only Alternative 1 and the No-Action Alternative are carried forward for analysis.

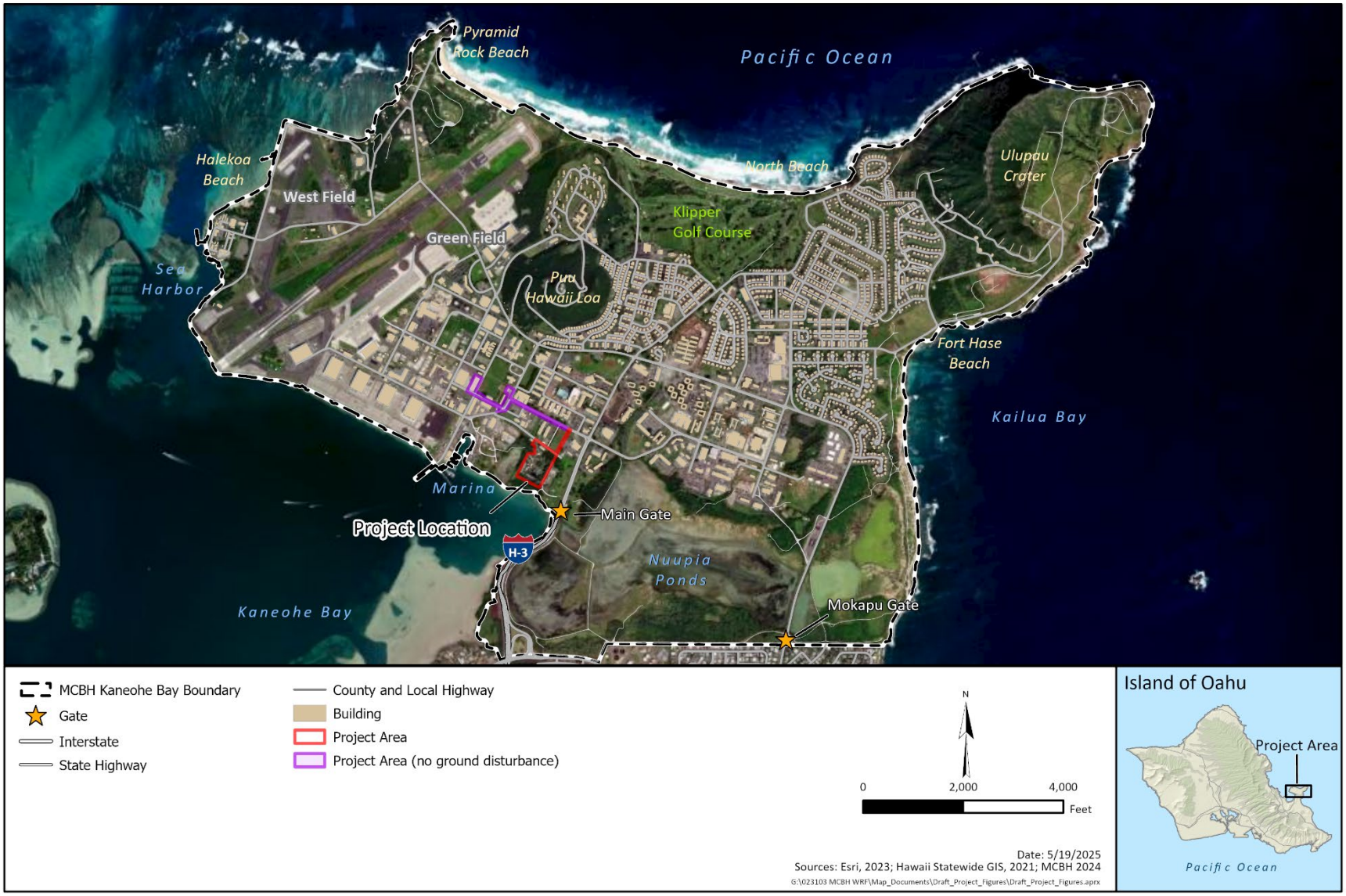

Figure S.1-1 Project Location at MCBH Kaneohe Bay

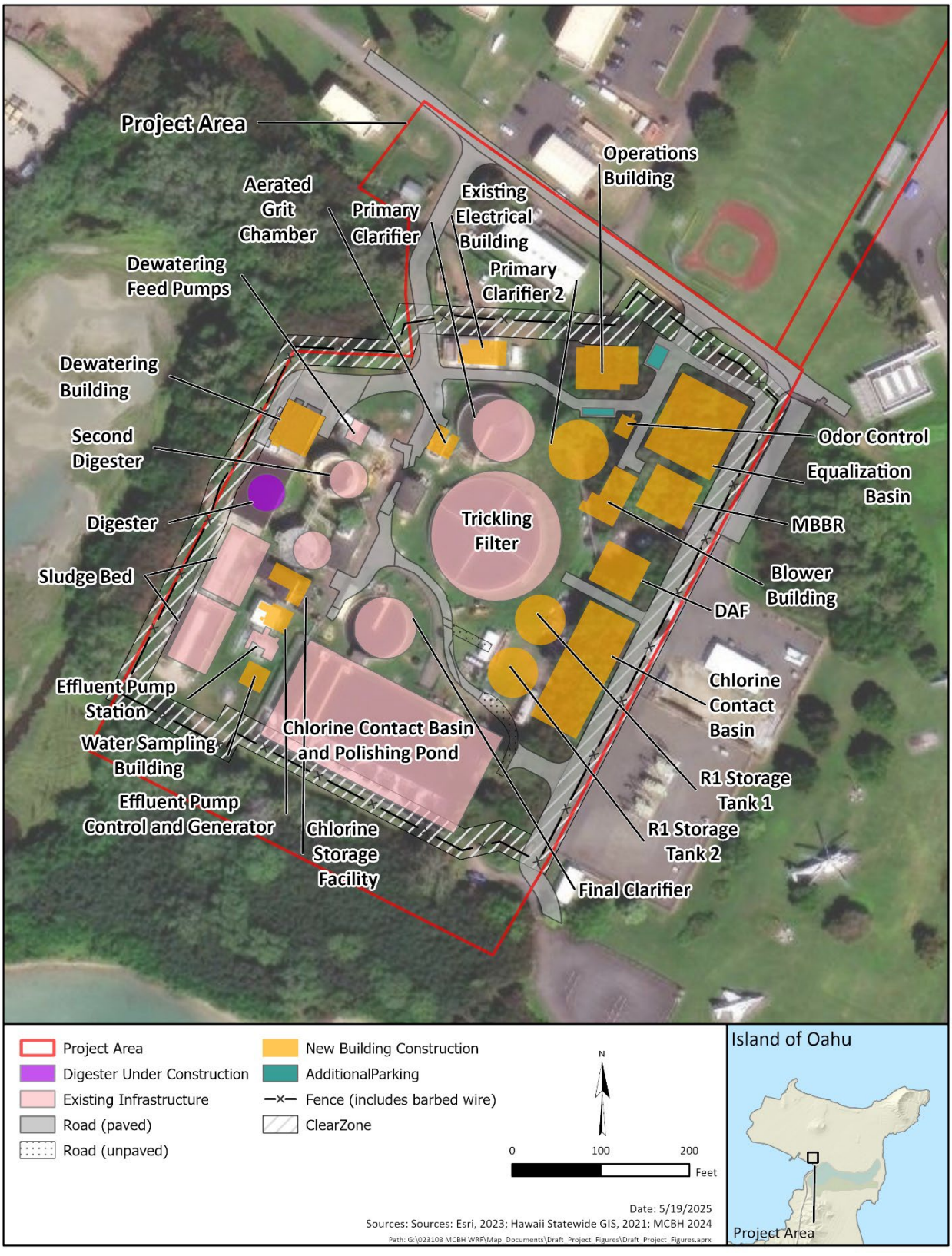

Figure S.1-2 Proposed Water Reclamation Facility Upgrades

S.4 Summary of Potential Environmental Effects of the Alternatives

Table S.4-1 presents a summary of potential environmental effects associated with the proposed action.

Table S.4-1 Summary of Potential Effects

Resources	*Alternative 1*	*No-Action Alternative*
Noise	• Less than significant effects. • Construction would be localized, temporary, and limited to daytime hours. • Proposed operations at WRF would be similar to existing WRF operations.	• Under the No-Action Alternative, the proposed action would not occur, and noise effects would remain at existing levels.
Air Quality	• Less than significant effects. • Construction activities would only minimally increase emissions and would not substantially contribute to global warming. • Proposed operations would involve no change in stationary source air emissions from WRF operations on an annual basis.	• Under the No-Action Alternative, the proposed action would not occur, and air quality would remain at existing levels.
Water Resources	• Less than significant effects to groundwater, surface water, wetlands, and floodplains. • The proposed action would follow the DOH NPDES Construction General Permit and would comply with the base individual MS4 NPDES permit #HIS000007 (hereafter referred to as the "MS4 permit"). • The upgraded WRF would improve the quality of the wastewater discharging into the municipal plant outfall. • The proposed action would follow a site-specific SWPPP, BMPs, and storm water runoff protection measures.	• Under the No-Action Alternative, the proposed action would not occur, and effects to water resources would remain at existing levels.
Cultural Resources	• Less than significant effects to archaeological resources. • No historic properties would be affected.	• Under the No-Action Alternative, the proposed action would not occur, and the effects to cultural resources would remain at existing levels.
Terrestrial Biological Resources	• Less than significant effects to vegetation, wildlife, critical habitat, and ESA-listed species. • Pursuant to the USFWS, the barbed wire fence would not result in a take of hoary bat during the life of the fence. • Effects to Hawaiian Stilts would be minimized through BMPs, such as prevention of standing water, bird deterrents and barriers, nest and chick protocols, and use of a full-time biological resources monitor.	• Under the No-Action Alternative, the proposed action would not occur and effects to terrestrial biological resources would remain at existing levels.

Resources	*Alternative 1*	*No-Action Alternative*
Utilities	• The proposed action would have beneficial effects to utilities. • The proposed action would not increase utilities demand, and all utility systems have adequate capacity to support the proposed action. • The proposed action would have beneficial effects to potable water through use of recycled water and for storm water through installation of LID features that would reduce storm water discharge.	• Under the No-Action Alternative, the proposed action would not occur and effects to utilities would remain at existing levels.
Transportation	• Less than significant effects. • Construction traffic would be considerably less than 1% of average daily traffic volume on H-3 and have less than significant effects to H-3 traffic.	• Under the No-Action Alternative, the proposed action would not occur and effects to transportation would remain at existing levels.

Legend: % = percent; BMP = Best Management Practice; DOH = Hawai'i State Department of Health; ESA = Endangered Species Act; LID = Low Impact Development; MS4 = Municipal Separate Storm Sewer System; NPDES = National Pollutant Discharge Elimination System; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service; WRF = Water Reclamation Facility.

S.5 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps solicited public and agency input regarding the proposed action through publication of the Draft Environmental Assessment (EA). The Marine Corps published a notice of availability for review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. The public had 30 days to comment on the EA, as well as the National Historic Preservation Act (NHPA) Section 106 process to date. Prior to the release of the Draft EA, the MCBH Public Affairs Office coordinated with the local community at monthly Neighborhood Board meetings and other public engagement opportunities about the proposed action and the Draft EA public comment period.

The Final EA is available on the State of Hawai'i's Environmental Review Program website: https://planning.hawaii.gov/erp and the MCBH website: https://www.mcbhawaii.marines.mil/Offices-and-Staff/Environmental/#tab/environmental-evaluations.

Public comments on the Draft EA were considered in the development of the Final EA prior to the Marine Corps rendering its decision on the proposed action. A detailed summary of public comments, revisions made to the EA in response to comments, and responses to comments is provided in Appendix B of the Final EA.

In accordance with Section 106 of the NHPA, the Marine Corps coordinated with the Hawai'i State Historic Preservation Officer (SHPO), Native Hawaiian Organizations, interested parties, and the public regarding a finding of no historic properties affected by the proposed action. The SHPO concurred with this finding with the provision that the Marine Corps will provide the SHPO with an archaeological monitoring report following completion of archaeological monitoring (Appendix C).

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps conducted informal and formal consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) regarding potential effects to ESA-listed species (Appendix D). The Marine Corps initiated consultation by

submitting a Biological Assessment to the USFWS on October 8, 2024. Consultation concluded with the USFWS issuing a Biological Opinion on March 28, 2025. The USFWS BO concluded that Alternative 1 for the proposed action will not jeopardize the continued existence of Hawaiian Stilt and is not likely to adversely affect other ESA species. The USFWS provided an Incidental Take Statement (ITS) in their BO for Hawaiian Stilt.

Regarding consistency with the Coastal Zone Management Act (CZMA), the proposed action falls under the "Navy/Marine Corps De Minimis Activities List Under CZMA." The Marine Corps notified the State of Hawai'i Office of Planning and Sustainable Development, Planning Division regarding its determination on January 8, 2025 (see CZMA correspondence in Appendix E). On February 12, 2025, the Planning Division acknowledged that the proposed activities are not subject to further review by the Hawaii Coastal Zone Management Program because the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation/General Conditions."

Environmental Assessment

Water Reclamation Facility Upgrade

Marine Corps Base Hawaii

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Abbreviations and Acronyms

Item	Definition	Item	Definition
APE	Area of Potential Effects	Marine Corps	United States Marine Corps
BA	Biological Assessment	MBTA	Migratory Bird Treaty Act
BMP	Best Management Practice	MCBH	Marine Corps Base Hawaii
BO	Biological Opinion	mgd	million gallons per day
CAP	Corrective Action Plan	MS4	Municipal Separate Storm Sewer System
C.F.R.	Code of Federal Regulations	NAAQS	National Ambient Air Quality Standards
CO_2	Carbon Dioxide		
CO_2e	Carbon Dioxide Equivalent	NAGPRA	Native American Graves Protection and Repatriation Act
CZMA	Coastal Zone Management Act		
dB	Decibel	NAVFAC	Naval Facilities Engineering Systems Command
dBA	A-weighted Decibel		
DLNR	Department of Land and Natural Resources	Navy	United States Department of the Navy
DNL	Day-Night Average Sound Level	NEPA	National Environmental Policy Act
DoD	United States Department of Defense	NHPA	National Historic Preservation Act
DOH	Hawai‘i State Department of Health	NOAA	National Oceanic and Atmospheric Administration
DON	Department of the Navy		
EA	Environmental Assessment	NOAV	Notice of Apparent Violation
EO	Executive Order		
ESA	Endangered Species Act	NOVO	Notice of Violation and Order
EPA	United States Environmental Protection Agency	NPDES	National Pollutant Discharge Elimination System
FEMA	Federal Emergency Management Agency	ROI	region of influence
FY	Fiscal Year	SHPO	Hawai‘i State Historic Preservation Officer
GHG	Greenhouse Gas		
HAR	Hawai‘i Administrative Rule	SO_2	Sulfur Dioxide
HDOT	Hawai‘i Department of Transportation	SOP	Standard Operating Procedure
ICRMP	Integrated Cultural Resources Management Plan	SWPPP	Storm Water Pollution Prevention Plan
		U.S.	United States
ITS	Incidental Take Statement	U.S.C.	United States Code
LID	Low Impact Development	USFWS	United States Fish and Wildlife Service
L_{max}	Maximum A-weighted sound level	WRF	Water Reclamation Facility

1

1 Purpose of and Need for the Proposed Action

1.1 Introduction

Marine Corps Base Hawaii (MCBH) Kaneohe Bay, on the island of O‘ahu, Hawai‘i, operates a Water Reclamation Facility (WRF) to treat wastewater at the base. The WRF uses a “single-train treatment process,” meaning it cannot operate effectively when components are offline for repair or maintenance. This facility currently treats water in accordance with National Pollutant Discharge Elimination System (NPDES) permit HI0110078 (here after referred to as the “NPDES wastewater permit”). MCBH coordinates planned maintenance events with the Hawai‘i State Department of Health (DOH). In order for MCBH to ensure compliance with its NPDES wastewater permit, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The proposed action would also improve the overall quality of the treated effluent to R-1 standards, reduce overall water demand from the City and County of Honolulu Board of Water Supply, and improve the WRF to meet tsunami design standards.

More specifically, the proposed action would create a redundant capability through the construction of additional WRF components, which would be integrated with and adjacent to the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events and for unscheduled repairs. The new WRF capability would allow existing and new unit processes to be removed from service for maintenance activities while still maintaining the ability to process and treat effluent to meet base needs. With the proposed upgrade and the new redundant system, the WRF would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the treated effluent, and implement tsunami design standards. While the upgrade would increase capacity to treat effluent at the WRF, there is no plan to increase the volume of water treated at the WRF.

The Marine Corps has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and Marine Corps Order 5090.2.

1.2 Location

The proposed action would occur at the existing WRF at MCBH Kaneohe Bay, west of the main gate and east of the marina (Figure 1.2-1). The facility is adjacent to Kāne‘ohe Bay on the southwest and the Salvage Yard Wetland on the west. Existing support facilities are to the north, and power substation facilities and the main gate are to the east.

1.3 Background

The WRF is a secondary biological treatment plant designed to accommodate an average daily flow of 2 million gallons per day (mgd). It is the only means of treating wastewater at MCBH Kaneohe Bay. The Marine Corps evaluated the existing capabilities of the WRF and the need for design improvements to ensure continued compliance with its DOH permit, which resulted in the proposed action that will not only improve the existing WRF but also provide a redundant system that would allow for full plant capacity even while maintenance and repair activities are conducted.

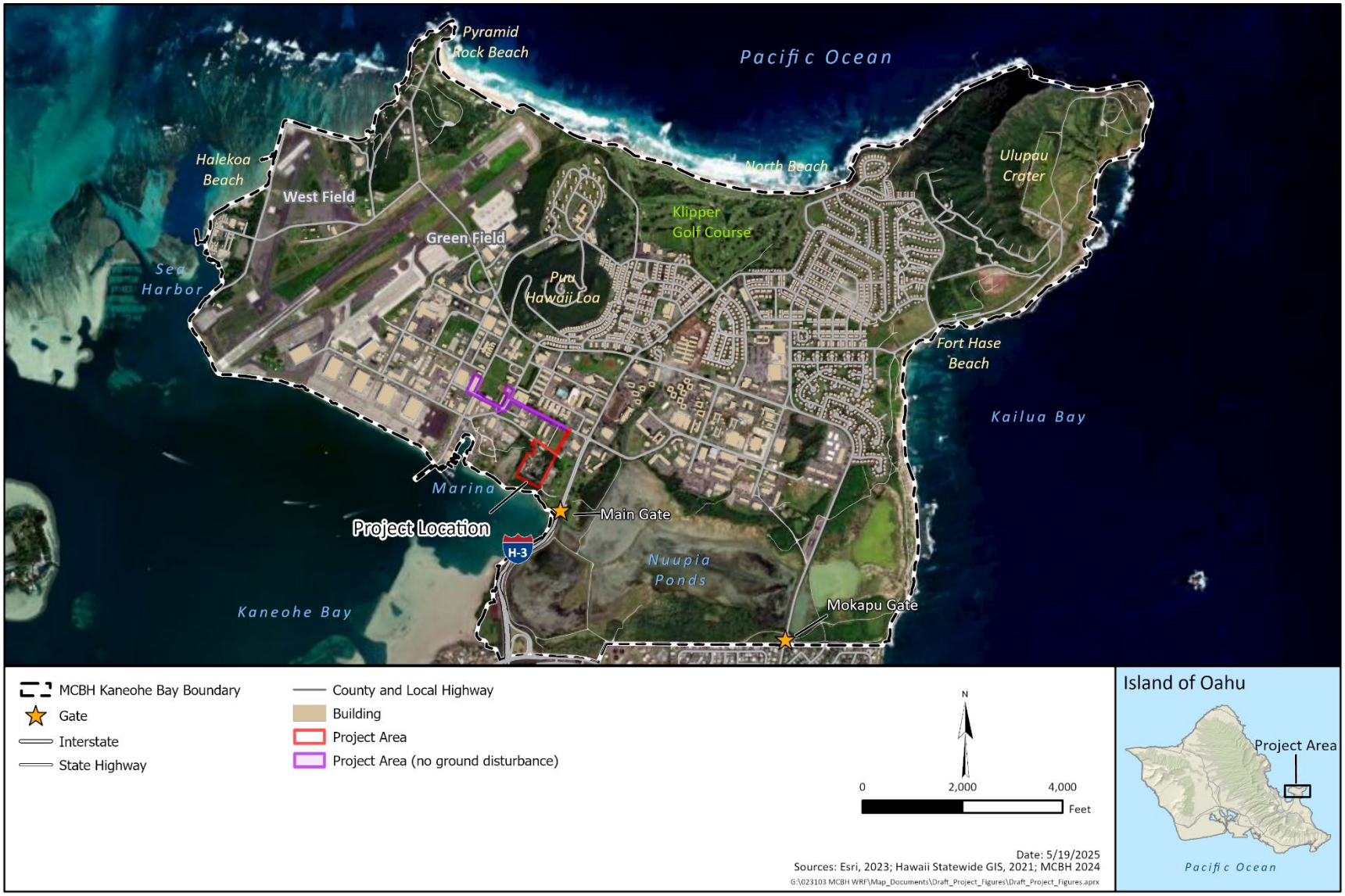

Figure 1.2-1 Project Location at MCBH Kaneohe Bay

This proposed upgrade to the current facility and development of redundant capacity at the WRF has been in development for several years. The existing WRF lacks the capability to ensure that treated effluent continues to meet existing permit limitations during planned maintenance events and unforeseen repairs without significantly altering the flow process. In addition, upgrades are needed to improve treated water capabilities such that the improved water could again be used for irrigation purposes, thereby reducing overall water demand from the City and County of Honolulu Board of Water Supply.

Both MCBH and DOH recognize the need for WRF upgrades and added redundancy. In 2019, during DOH's Compliance Evaluation Inspection of the WRF, DOH identified a failure to operate or maintain wastewater treatment units and to monitor and report discharges exceeding permit levels. DOH conducted a second Compliance Evaluation Inspection on February 11, 2021, and this time issued a Notice of Apparent Violation (NOAV) to the MCBH Kaneohe Bay WRF (File No. 04006EBT.21, April 5, 2021) for the same deficiencies (DOH, 2021a). This NOAV required preparation of a Corrective Action Plan (CAP), which the Marine Corps subsequently submitted on May 20, 2021 (MCBH, 2021a). The CAP identified two WRF deficiencies (a secondary clarifier ring and the influent flow meter) and plans for correcting them. Also in 2021, the base completed a separate study on how to best address the shortcomings of the existing facility and need for a redundant system.

On March 31, 2022, the Hawai'i state legislature supported DOH's findings and adopted State of Hawai'i House Resolution No. 63, H.D. 1 "urging Marine Corps Base Hawaii to upgrade the capacity of its sewage treatment plant and redundancy of the components to ensure that final effluent quality is in compliance with State permitting requirements" (State of Hawai'i, 2022). On May 6, 2022, DOH issued a Notice of Violation and Order (NOVO) to MCBH Kaneohe Bay for discharging wastewater in excess of the base's NPDES wastewater permit (DOH, 2022). The Marine Corps submitted a CAP Update on June 22, 2023, proposing installation of flow meters to address the deficiencies identified in the 2021 NOAV. The Marine Corps submitted a CAP closure notice on October 28, 2024, stating that all work had been completed (MCBH, 2024a).

On March 14, 2025, DOH issued a NOVO to MCBH for failing a Whole Effluent Toxicity test and for not disclosing the routine use of sodium hypochlorite (a common disinfectant) at the WRF (DOH, 2025). MCBH took corrective actions, including updating its standard operating procedures (SOPs) to strengthen adherence to DOH permit requirements and wastewater monitoring processes.

1.4 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system equal to the capacity of the existing facility. The proposed action, designed to meet water quality and disinfection permit standards, would also provide new water reuse capabilities on base, and be constructed to meet tsunami design requirements. The proposed action is needed to provide treatment processes that will ensure compliance with MCBH's NPDES wastewater permit and resolve outstanding deficiencies.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental effects of the proposed action. The process for identifying resources analyzed in this EA is summarized in Chapter 3, *Affected Environment and Environmental Consequences*. This EA evaluates the potential environmental effects of the proposed

action to the following resources: noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation.

1.6 Relevant Laws and Regulations

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

1.7 Public and Agency Participation and Intergovernmental Coordination

The Marine Corps solicited public and agency input regarding the proposed action through publication of the Draft EA. The Marine Corps published a notice of availability for review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. The public had 30 days to comment on the EA, as well as the National Historic Preservation Act (NHPA) Section 106 process to date. Prior to the release of the Draft EA, the MCBH Public Affairs Office coordinated with the local community at monthly Neighborhood Board meetings and other public engagement opportunities about the proposed action and the Draft EA public comment period.

The Final EA is available on the State of Hawai'i's Environmental Review Program website: https://planning.hawaii.gov/erp and the MCBH website: https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/Water-Reclamation-Facility-Upgrades-EA/.

Public comments on the Draft EA were considered in the development of the Final EA prior to the Marine Corps rendering its decision on the proposed action. A detailed summary of public comments, revisions made to the EA in response to comments, and responses to comments is provided in Appendix B of the Final EA.

In accordance with Section 106 of the NHPA, the Marine Corps coordinated with the Hawai'i State Historic Preservation Officer (SHPO), Native Hawaiian Organizations, interested parties, and the public regarding a finding that the proposed action would result in no historic properties affected. The SHPO concurred with this finding with the provision that the Marine Corps will provide the SHPO with an archaeological monitoring report following completion of archaeological monitoring (Appendix C).

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA), the Marine Corps conducted informal and formal consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) regarding potential effects to ESA-listed species (Appendix D). The Marine Corps initiated consultation by submitting a Biological Assessment (BA) to the USFWS on October 8, 2024, and consultation was concluded when the USFWS issued a Biological Opinion (BO) on March 28, 2025. The USFWS BO concluded that Alternative 1 for the proposed action will not jeopardize the continued existence of Hawaiian Stilt and is not likely to adversely affect other ESA species. The USFWS provided an Incidental Take Statement (ITS) in their BO for the Hawaiian Stilt.

Regarding consistency with the Coastal Zone Management Act (CZMA), the proposed action falls under the "Navy/Marine Corps De Minimis Activities List Under CZMA." The Marine Corps notified the State of Hawai'i Office of Planning and Sustainable Development, Planning Division regarding its determination on January 8, 2025 (see CZMA correspondence in Appendix E). On February 12, 2025, the Planning Division acknowledged that the proposed activities are not subject to further review by the Hawaii Coastal Zone Management Program because the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation/General Conditions."

1.8 Permits and Approvals

Multiple permits and approvals are required for the construction and operation of the proposed action, including: (a) NPDES permit coverage under the State of Hawai'i general permits for discharges of storm water associated with construction activities (State General Permit Appendix C), (including compliance with the base individual Municipal Separate Storm Sewer System [MS4] NPDES permit #HIS000007, [here after referred to as the "MS4 permit"]), discharges of hydrotesting waters (Appendix F), and discharges associated with construction activity dewatering (Appendix G); (b) authorization from the DOH to construct (Hawai'i Administrative Rules [HAR] Title 11, Chapter 62); and (c) authorization from the DOH to use recycled water for general irrigation (HAR 11-62). DOH will decide whether general or individual permit coverage is required. The Marine Corps would continue to coordinate with the DOH and U.S. Environmental Protection Agency (EPA) to ensure all necessary permits are obtained for the proposed action. The plant must be operated in a manner that is consistent with the sewerage agreement between the Marine Corps and City and County of Honolulu.

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2 Proposed Action and Alternatives

This chapter describes the proposed action, alternatives development (including alternatives considered but not carried forward for analysis), Alternative 1, the No-Action Alternative, and best management practices (BMPs) incorporated into the proposed action to avoid or reduce environmental effects.

2.1 Proposed Action

The proposed action is to upgrade the existing WRF and construct and operate a redundant wastewater treatment system. Figure 2.1-1 shows the proposed action, and Figure 2.1-2 shows the equipment and material laydown areas and construction haul routes. The proposed action would allow the WRF to maintain full capacity during maintenance activities and unscheduled repairs of the existing system, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would occur at the existing WRF entirely within MCBH Kaneohe Bay. The proposed action would be constructed over a 3-year period. The construction would be done in phases to mitigate disruptions to and maintain operation of the WRF.

The proposed WRF upgrades include:

- construction of associated sewage treatment facilities
- installation of security fencing
- redundancy upgrade
- tsunami designs
- capability to treat wastewater to reuse quality standards
- supporting improvements, including vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates
- construction laydown locations outside the WRF

Table 2.1-1 lists the construction projects for the proposed action. The proposed construction would occur on previously disturbed areas within the existing WRF footprint, including landscaped areas. No modifications to the ocean outfall would occur under the proposed action, and there would be a decrease in total discharge quantities due to the capability to produce recycled water at the WRF. The upgraded WRF would operate similar to the existing WRF. Five personnel operate the existing WRF; up to five additional personnel would be required to operate the upgraded WRF (Naval Facilities Engineering Systems Command [NAVFAC] Hawaii, 2024; MCBH, 2024b).

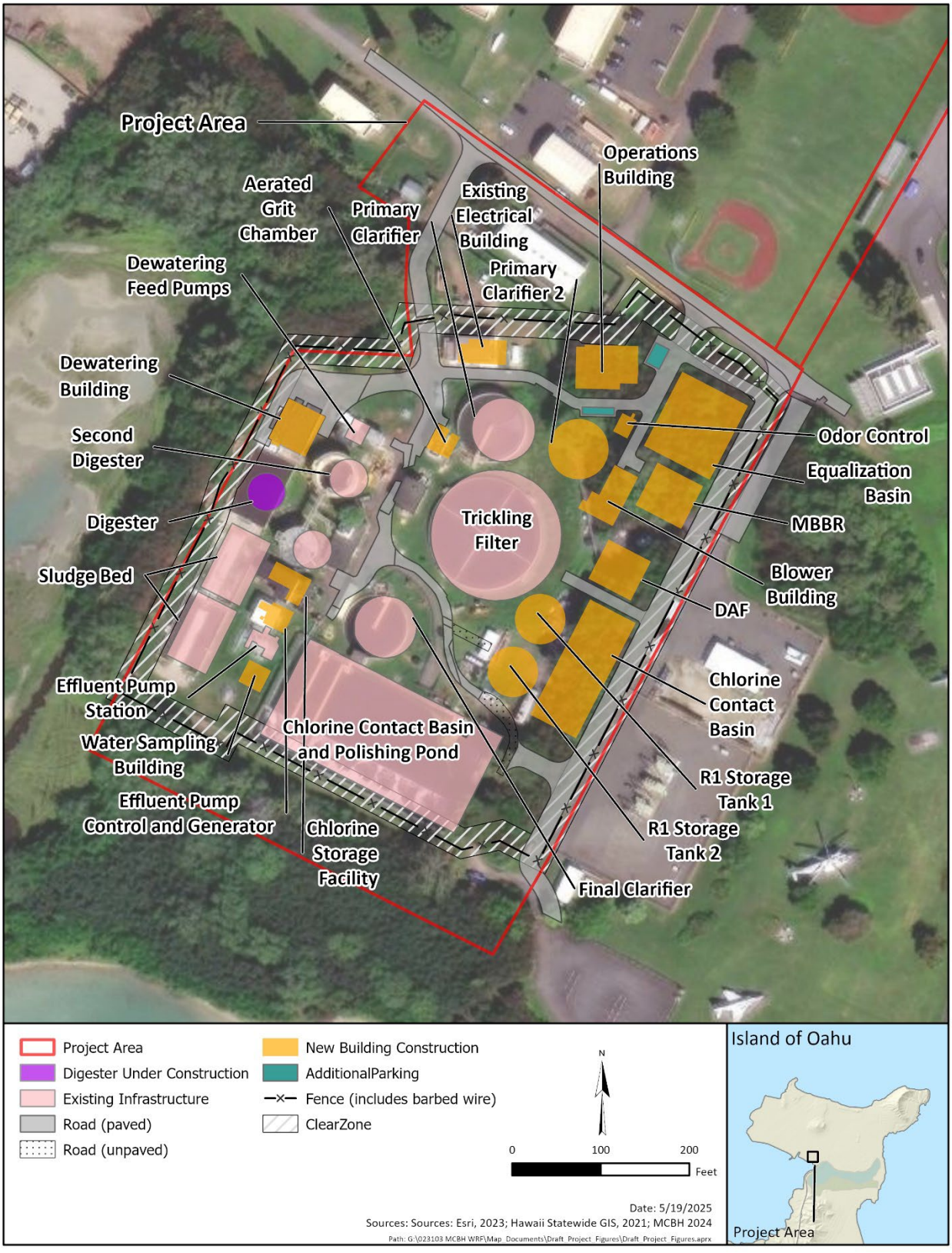


Figure 2.1-1 Proposed Water Reclamation Facility Upgrades

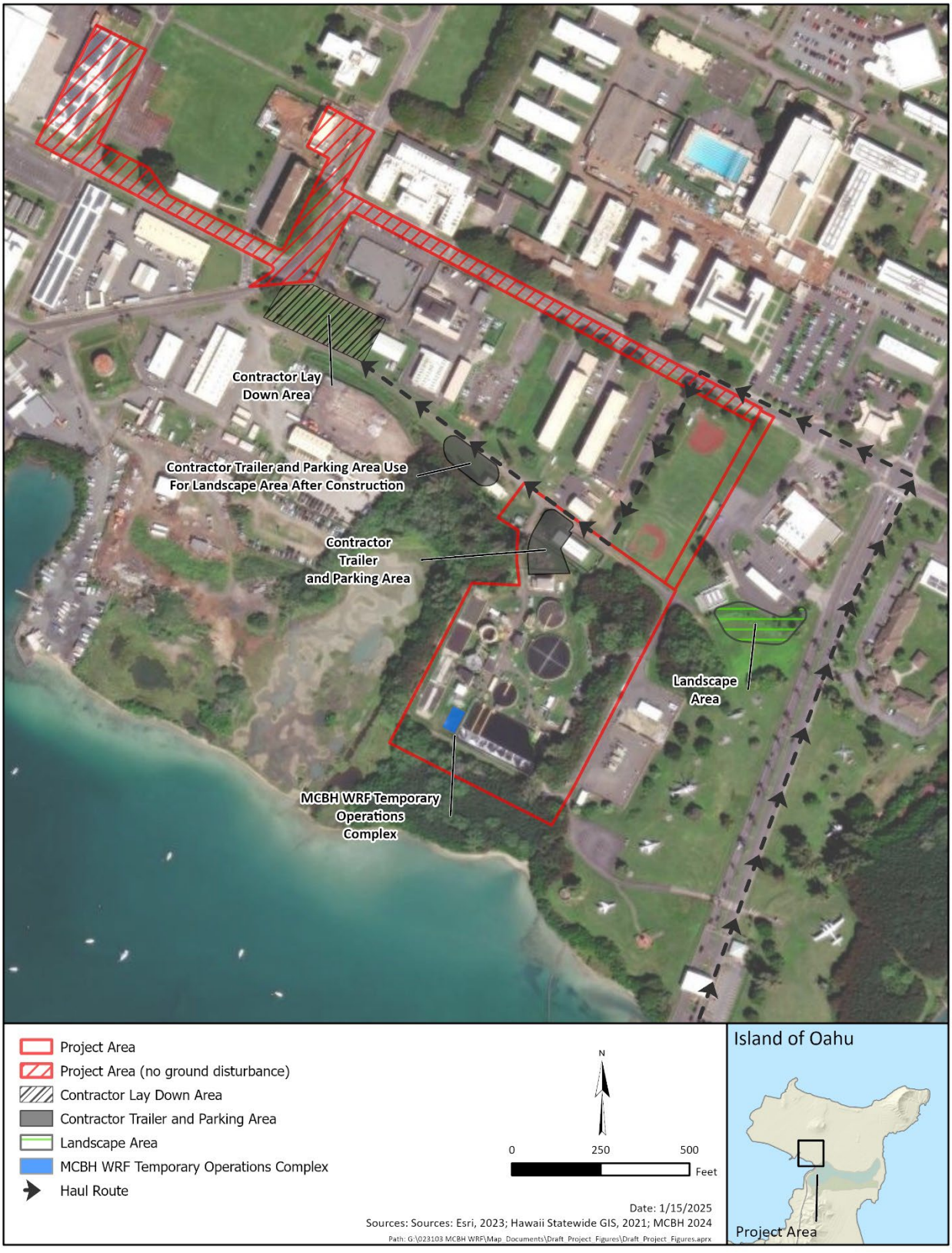


Figure 2.1-2 Proposed Construction Laydown Areas and Haul Routes

Table 2.1-1 Proposed Upgrade to MCBH Kaneohe Bay WRF

Component	*Area*	*Description*
New Facilities	1,475 SF	• Operations/Lab/Electrical building located northeast of the existing Electrical building • Sampler building facing the existing driveway to allow easy pedestrian access • Dewatering building on the west side • Blower building on the east side
Tsunami Designs	7,803 SF	• Burners would be located on top of concrete structures to keep equipment above tsunami inundation level • Aeration blowers would be located on the second level of buildings to protect from flooding/inundation • Power duct banks in the yard would be designed to withstand seismic and tsunami events
Redundancy WRF Upgrade	NA	New Unit Processes: • Primary Clarifier 2, Equalization Tank, Fine Screens, Moving Bed Biofilm Reactors, Dissolved Air Flotation, Cloth Disk Filters, Chlorine Contact Channels for Disinfection, R-1 Storage Tanks, and Dewatering Equipment enabling system to produce R-1 water Unit Processes to be matched for redundancy include: • Aerated Grit Chamber and Anaerobic Digester
Utilities	21,175 SF	• Potable Water and Compressed Air • Electrical utilities include primary electrical distribution, secondary electrical distribution, transformers, exterior lighting, a supervisory control and data acquisition system, and telecommunications infrastructure • New electric feeder cables that utilize an existing conduit (no ground disturbance) • Communication Connection duct bank (21,175 SF trenching through grass area)
Fencing and Gates	2,193 LF 72,637 SF	Increased Fencing: • Perimeter fencing with clear zones and no trespassing signage would be placed; clear zone of 10 feet minimum exterior and 20 feet minimum interior (includes 70,000 square feet of vegetation removal) • The perimeter fence along the existing west side would remain • The facility would have a perimeter fence enclosure consisting of an 8-foot-tall fence with 7-foot-tall chain-link and 1-foot-tall single outrigger with 3 strands of barbed wire on the top of the fence
Paving and Site Improvements	1,706 SF gravel 43,723 SF paved	• Site demolition, paving roadways, landscaping, and bollards • Existing gravel roads disturbed by construction activity would be replaced with gravel pavement • All new roads would be asphalt pavement • Storm drainage: new catch basins and curb inlets draining to a new pipe system • Additional lighting along roadways, parking areas, and gate entrances • Includes clearance of 17,000 SF of landscaped grass and scrub at the entrance
Parking	719 SF	• Three new parking spaces east of the new Operations/Lab/Electrical building • Two additional parallel parking spaces provided south of the Operations building

Component	*Area*	*Description*
Total Disturbance Area	138,256 SF (3.0 acres)	

Notes: Construction components are shown in Figure 2.1-1.
Legend: LF = linear feet; MCBH = Marine Corps Base Hawaii; NA = not applicable; SF = square feet; WRF = Wastewater Reclamation Facility.
Source: NAVFAC Hawaii, 2024.

2.1.1 Proposed Upgrades

2.1.1.1 New Facility Construction

The proposed action constructs new operational sewage treatment components and associated support equipment at the WRF at MCBH Kaneohe Bay. The proposed construction would take place in already developed areas. The associated treatment facilities to be constructed include an Operations/Laboratory/Electrical building, a sampler building, a dewatering building, and a blower building (see Figure 2.1-1). The new facilities would house and safeguard equipment and utility infrastructure while also providing space for operational and laboratory needs. Along with new facility construction, many buildings and structures would be consolidated or removed from the WRF. Construction laydown areas outside the WRF would be used for staging equipment and materials during construction.

2.1.1.2 Redundancy WRF Upgrade

Proposed WRF upgrades include adding an additional process system to allow unit treatment systems to be taken offline for maintenance or repair without affecting the WRF's ability to meet its permit requirements. By providing integration with the existing treatment system, both systems would have the capability to produce R-1 recycled water.

2.1.1.3 Utilities

The proposed action would include upgrades to water, sewer, and electrical utilities. The project would incorporate energy-efficient designs, including a sanitary sewer system, gravity and pressure pipelines, and energy-efficient equipment and energy-saving materials in coordination with the Hawaiian Electric Company Energy. New electric feeder cables that utilize an existing conduit will be installed between the WRF and 3rd Street. There will be trenching between the WRF and 3rd Street for a new Communication Connection duct bank.

2.1.1.4 Paving and Site Improvements

Proposed paving and site enhancements include the demolition of existing structures, paving of access roads, landscaping, and installation of fencing. Paving would enhance pedestrian pathways and improve access roads. Additional site improvements would include constructing retaining walls; installing signage, fountains, handrails, and guardrails; and landscaping of lawns, grasses, and exterior plants.

2.1.1.5 Parking

An additional five parking spaces would be added outside the new Operations/Laboratory building.

2.1.1.6 Tsunami Designs

New facilities constructed as a part of the upgrade to the WRF would meet Risk Category III and Tsunami Risk Category III requirements, resulting in a tsunami design consistent with American Society of Civil Engineers 7-16 Tsunami Geodesign Database. The Unified Facilities Criteria 3-301-01, *Structural Engineering* provides requirements for structures designed and constructed for the Department of Defense (DoD). The designed upgrades would account for a maximum tsunami water inundation elevation of 21.3 feet above mean sea level, a peak flow velocity of 20 feet per second, and a future sea level rise of 1.3 feet at the site. The site-specific value is from the DoD Regional Sea Level database that corresponds to the designated scenario for the year 2065.

2.1.1.7 Fencing and Gates

The WRF upgrade includes installation of a perimeter fence enclosure consisting of a 7-foot-tall chain-link fabric fence with a 1-foot-tall single outrigger with barbed wire (8 feet total height) (see Figure 2.1-1). MCBH Security requires barbed wire fencing based on a vulnerability assessment (classified document). This security feature helps prevent unauthorized access, ensure safety, and protect the property from vandalism.

2.1.2 Proposed Operations

The upgraded WRF would improve water treatment from the current secondary treatment level to tertiary treatment through the addition of equipment and processes such as filtration, disinfection, and de-chlorination. In addition, it would provide full redundancy and integration enabling future maintenance, repairs, and replacements to occur while continuing to meet treated effluent standards. Discharge of treated effluent would not change; the treated effluent would continue to be discharged to the municipal outfall and ultimately to Kailua Bay. The treated effluent is not discharged into the Kailua treatment plant; it is discharged into the outfall pipe that is shared with the Kailua Regional Wastewater Treatment Plant. In addition, the upgraded WRF would be capable of improving treated water from R-2 (having more restrictions on reuse) to R-1 (a higher grade of recycled water having less restrictions on reuse). R-2 level means recycled water where the wastewater has undergone oxidation and disinfection, while R-1 (the highest grade of recycled water) also undergoes filtration. The R-1 recycled water could be used for irrigation at the Klipper Golf Course, thus saving approximately 100,000 to 300,000 gallons of potable water per day from the City and County of Honolulu Board of Water Supply and reducing the volume of effluent discharged into Kailua Bay. No other pipe distribution system for R-1 water use exists on the base.

Figures 2.1-3 and 2.1-4 show an overview of the proposed treatment process and the flow to the existing ocean outfall, respectively. The existing WRF is currently sized for a 2-mgd flow on an average daily flow basis. The upgraded WRF would include new treatment unit processes—a redundant wastewater treatment system—that also would have a 2-mgd average daily flow capacity, allowing unit processes to be removed from service for maintenance activities without negatively affecting effluent quality. The upgraded treatment facilities would be sized to accommodate higher peak flows, referred to as the Average Day Maximum Month conditions. These are based on the average peaking factors for average daily flow from 2018 to 2021. A backup aerated grit tank would be constructed to handle flow from the influent pump station, matching the existing tank's capacity to treat 2 mgd on average and up to 10 mgd peak flow during heavy rain events. MCBH Kaneohe Bay is not a combined sewer system, so

on-base storm water is directed to the MS4 and does not affect the WRF. During heavy rain, the volume of water treated at WRF increases due to infiltration and inflow issues within the sewer collection system.

The new unit processes would become the main treatment train, receiving the majority of influent wastewater flow under normal conditions. The existing unit processes would still receive influent wastewater to maintain biological growth for the trickling filter. Approximately 20 percent of the influent flow would be conveyed to the existing unit processes, which would also be routed to the new system for disinfection.

The proposed action would result in a redundant wastewater reclamation and treatment process capable of producing R-1 quality water for reuse. The new R-1 water system would include two R-1 750,000-gallon concrete storage tanks on the southeast corner of the WRF that would protect against overfilling. The new system would be integrated with the existing treatment system resulting in both systems being able to produce R-1 water. The upgraded system would be designed to provide disinfection for 100 percent of the effluent treated by the tertiary treatment system.

The State of Hawai'i approves the use of recycled wastewater for landscape irrigation. The existing effluent chlorination system, currently inactive, was historically used for in-plant processes and to irrigate the Klipper Golf Course with R-2 quality reuse water via a 1-mile-long pipeline. The proposed action would allow the WRF to produce R-1-quality recycled water, which meets higher treatment and application standards than R-2 recycled water. The distribution pipeline within the WRF site used to convey water to the Klipper Golf Course would be re-aligned along the east side of the WRF. There would be no change to the pipe distribution system between the WRF and the Klipper Golf Course. When the new treatment process is online, the upgraded WRF would be able to convey R-1 water to the Klipper Golf Course. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Any remaining treated effluent would continue to be directed to the Kailua Regional Wastewater Treatment Plant outfall for ocean disposal using the existing effluent pump system (i.e., Effluent Outfall 001). Irrigation of the Klipper Golf Course with R-1 quality recycled water would reduce the amount of treated wastewater discharged through the Kailua Regional Wastewater Treatment Plant outfall, with the actual amount of treated effluent diverted for irrigation purposes based on the daily needs of the Klipper Golf Course. In addition, the R-1 system would allow use of in-plant water for WRF operations and maintenance (e.g., lubrication, wash downs), which would reduce potable water use at the facility. As noted in Section 2.1, no modifications of the ocean outfall or changes in outfall use would occur under the proposed action.

2.2 Alternatives

NEPA requires agencies to consider reasonable alternatives to the proposed action. The identification, consideration, and analysis of alternatives are important aspects of the NEPA process and contribute to the goal of informed decision making. The Marine Corps implemented a design review process (NAVFAC Hawaii, 2024), which identified one reasonable alternative which meets the purpose and need of the proposed action. Pursuant to NEPA, a No-Action Alternative is also included as a baseline for analysis.

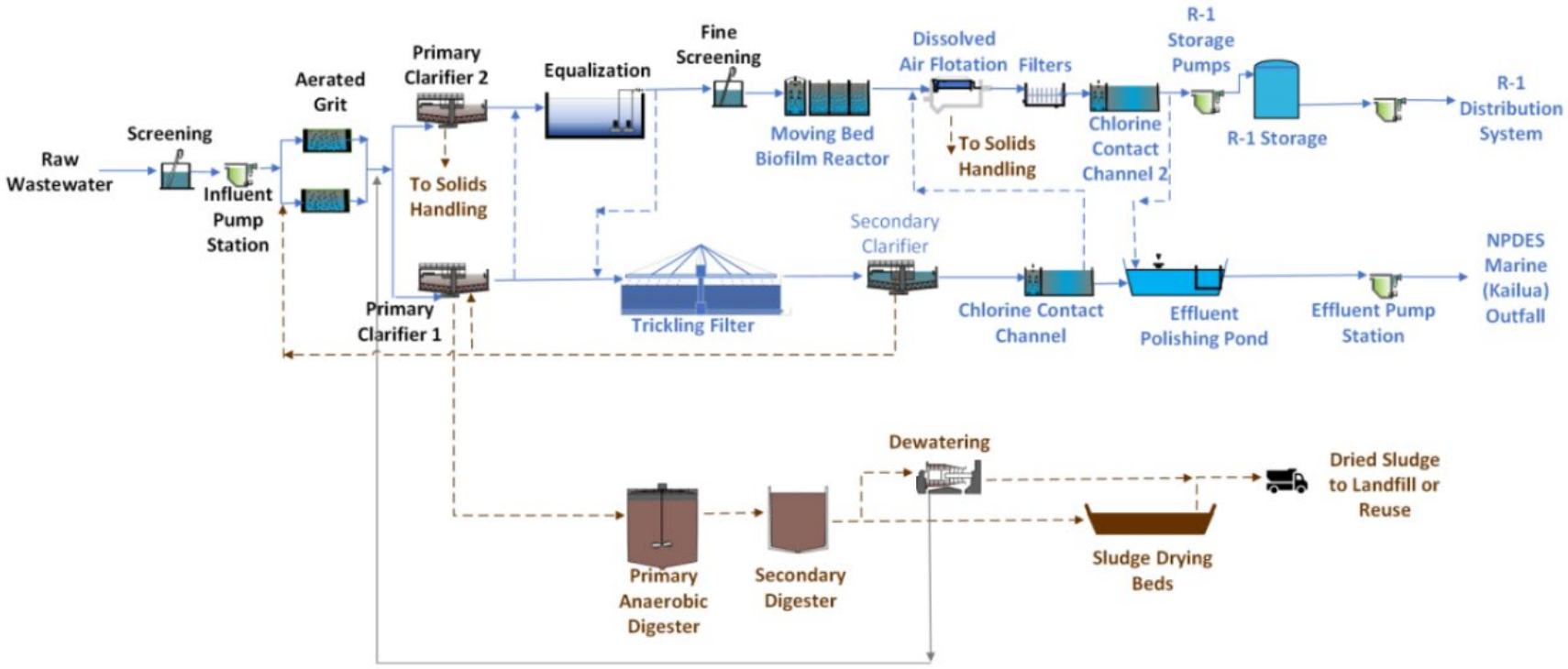
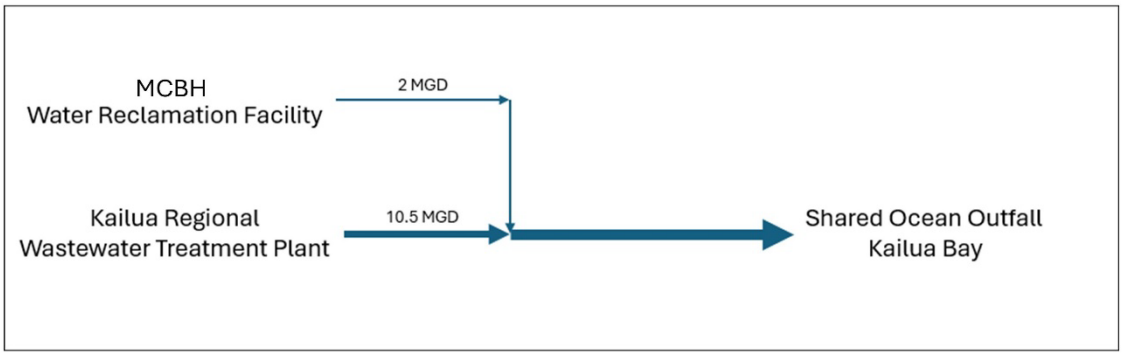


Figure 2.1-3 Water Reclamation Facility Process



The Marine Corps Base Hawaii (MCBH) Water Reclamation Facility and the Kailua Regional Wastewater Treatment Plant work independently of each other. The Kailua Regional Wastewater Treatment Plant does not treat wastewater from MCBH. The two facilities only share the outfall pipe into Kailua Bay after wastewater is treated at each facility.

mgd = million gallons per day

Figure 2.1-4 Flow to Existing Shared Ocean Outfall, Kailua Bay

2.2.1 Alternatives Considered but not Carried Forward for Analysis

The Marine Corps considered and eliminated from detailed analysis the alternatives below:

- New Treatment Technologies. New treatment technologies to include use of membrane bioreactors and ultraviolet disinfection treatment were considered but not carried forward for analysis because of the complexities of operating such systems and their reliability and required maintenance.
- Addition of another trickling filter. This is not possible due to insufficient space at WRF.

2.2.2 Alternatives Carried Forward for Analysis

The design review process identified WRF upgrades to the existing system and construction of a redundant treatment system as the only reasonable alternative. These upgrades comprise the proposed action (see description earlier in Section 2.1).

2.2.3 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. The existing WRF would operate without the upgrades necessary to ensure continued treatment of wastewater during maintenance and repairs, and without a redundant capability to treat on-base wastewater. The No-Action Alternative does not meet the purpose and need for the proposed action; however, as required by NEPA, the No-Action Alternative is carried forward for analysis.

2.2.4 Best Management Practices

BMPs are policies, practices, and measures the Marine Corps would implement as part of the proposed action to avoid or minimize potential environmental effects to the proposed action or established, regularly occurring practices routinely implemented for Marine Corps projects. In other words, the BMPs identified in this document are inherently part of the proposed action and are not proposed mitigation measures specifically identified as part of this NEPA environmental review process. Table 2.2-1 lists

BMPs that would be implemented as part of the proposed action. Additionally, the table incorporates conservation measures provided in the 2025 USFWS BO for the MCBH WRF Upgrade (Appendix D).

Table 2.2-1 Proposed BMPs and Conservation Measures

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
Best Management Practices			
Storm Water Management	Minimize pollutants in storm water flows	BMPs include filter socks around and filter fabric inside the storm drains to prevent pollutants from getting into the storm sewer system. Any stockpiled sediment would require filter socks and be frequently watered down using a water truck for dust control. At contractor trailer/staging areas and temporary operations trailers, BMPs include stabilized construction entrance and exits, boundary fencing with fabric, filter socks around perimeter, and/or silt fencing.	Construction
Storm Water Low Impact Development (LID) Techniques	Minimize pollutants in storm water flows	LID techniques such as bio-retention, vegetated swales, and/or vegetated filter strips would be used as required for ongoing management and treatment of storm water. Compliance with the requirements of the MS4 permit.	Construction, Operations
Storm Water Permit Requirements	Minimize pollutants in storm water flows	Compliance with the requirements of the MS4 permit for the discharge of storm water associated with construction activity, including a SWPPP.	Construction
Storm Water Diversion to Wetlands	Enhance water flow to wetlands	While not part of the proposed action, if the opportunity arises in the future, it is recommended to divert overland flow of water to the Salvage Yard Wetland.	Construction, Operations
Landscaping	Preferential planting of native plants	Include native plant vegetation restoration and landscape repair where possible for landscaping of new and renovated facilities.	Construction
Education	Minimize indirect effects to ESA-listed species from contractors, personnel, and dependents	All construction contractors and personnel would participate in MCBH Kaneohe Bay's existing natural resources education program. The program would include, at a minimum, the following topics: (1) occurrence of natural resources (including ESA-listed species); (2) sensitivity of the natural resources to human activities; (3) legal protection for certain natural resources; (4) penalties for violations of federal law; (5) general ecology and wildlife activity patterns; (6) reporting requirements; (7) measures to protect natural resources; (8) personal measures that users can take to promote the conservation of natural resources; and (9) procedures and a point of contact for ESA-listed species observations.	Construction, Operations
Protecting Current Wastewater Processes	Maintain operational capability during construction	Provide silt fences, socks, and other protective devices around critical components to ensure dust,	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		hyper-chlorinated water, or other potential contaminants do not affect effluent quality.	
Archaeological Monitoring	Avoid unintentional effects on archaeological resources	The proposed action will include archaeological monitoring to minimize effects to any cultural resources, including human remains (ʻiwi kūpuna), that may be present in historic fill material in the project area. The Marine Corps will provide the SHPO with an archaeological monitoring report within 90 calendar days from the end of ground-disturbing work.	Construction
Conservation Measures			
Prevention of Standing Water	Minimize attraction of birds	During construction, the contractor would take all reasonable actions to quickly rid the construction area of standing water as soon as it is discovered.	Construction
Bird Deterrents and Barriers	Minimize attraction of birds	The following deterrent efforts may be used to protect the Hawaiian Stilt by discouraging them from occupying areas of operation and construction. Some deterrents would result in the harassment of the birds to deter them from hazardous areas, while others are to control biologicals that attract birds. The following mitigations may be used separately or in combination to deter, frighten, or make the area uninviting for nesting, foraging, or loafing birds: • Physical deterrents, such as netting/wire over processes that attract stilts and ducks to prevent access • Visual deterrents, such as predator decoys - moving or stationary • Passive deterrents, such as hand clapping or noise making • Chemical deterrents, such as larvicides, e.g., *Bacillus thuringiensis israelensis* to control the bloodworm larvae (Chironomidae). Additional deterrent technologies not listed above may be evaluated in the future with close coordination with USFWS prior to any implementation.	Construction, Operations
Biological Monitor	Minimize Effects to ESA-listed species	A full-time biological monitor familiar with identification and behavior of the ESA-listed species would be on-site during all phases of construction, to include, but not limited to, mobilization, demolition, construction activities, demobilization, earth moving, and operational activities, to ensure that no federally-listed waterbirds are harassed, injured, or killed by equipment and vehicle movement or construction activities. • The biological monitor would educate WRF operational personnel, project personnel, and contractors about the presence of federally listed	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		species within and adjacent to the project site, legal responsibilities, agreed upon avoidance, minimization, and conservation measures, and notification protocols. • The biological monitor would continuously survey and monitor the WRF compound and project site throughout the day while contracted workers are on-site. • The biological monitor would check all exposed trenches and holes to ensure the proper protective measures have been installed and that they are covered at the end of each workday. • The biological monitor would check the area for standing water and alert the contractor to remove water as quickly as possible. • The biological monitor would notify the Environmental Natural Resources staff of any observed ESA violations or potentially unauthorized or illegal activities and actions.	
Nest and Chick Protocols	Minimize Effects to Hawaiian Stilts	Surveys would be conducted daily by a qualified biologist to determine if any nesting is occurring and share any information with the contractors and facility operators. If a Hawaiian Stilt nest or chicks are found within the WRF compound: • USFWS biologists, USFWS Special Agents, MCBH CLEO, and MCBH ECPD Natural Resources staff would be notified within 24 hours and would be provided access to witness mitigation measures. • USFWS has recommended the establishment and maintenance of a 100-foot buffer. However, per the 2025 BO, MCBH would establish a 50-foot buffer around all active nests and limit actions within the buffer. If the 50-foot buffer is not sufficient to prevent disturbance to a nesting stilt, the USFWS would be consulted; construction outside the buffer area can be performed without limitations. Should the 50-foot buffer not be practical or effective considering the small footprint of the WRF, mitigations such as erecting a temporary fence that isolates the bird from construction activity may be implemented upon approval from USFWS and ECPD Natural Resources staff. • If the protective buffer or temporary fencing significantly affects construction schedules or site development activities that are necessary to comply with regulatory requirements, WRF personnel (or its contractors) would consult with ECPD to implement a nest-specific plan to avoid the loss of eggs and death or injury of chicks, if	Construction, Operations

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		feasible. Before any plan is implemented, ECPD would consult with USFWS to determine the appropriate course of action to mitigate adverse effects to the nesting bird.	
Notification of Dead, Dying, or Injured Birds	Timely response to wildlife incidents	The WRF personnel and construction contractors would notify the biological monitor, or in their absence, the ECPD Natural Resources staff within 24 hours of discovery of any dead, dying, or injured birds.	Construction, Operations
Dust Barrier	Reduce effects from fugitive dust on ESA-listed species	Eight-foot dust barrier fencing would be installed around the material and equipment laydown yard and temporary contractor on-site office space to limit fugitive dust, visual disturbances, act as a barrier to roaming chicks, and in general to keep wildlife out of active areas. The construction fence would remain in place until project completion. Water would periodically be sprayed on areas of barren soil created during construction activities to keep dust down when exposed to periodic trade winds.	Construction
Access Barriers	Minimize waterbird access to the construction/demolition site to reduce risk of injury	• A 3–4-foot barricade fence would be installed around the site to be demolished. It would remain in place until all debris is removed from the area. • During trenching and hole digging activities to install pipes or communication, utility, and electrical lines, open trenches and holes would be covered at the end of the workday or any extended period of time without activity, e.g., 2–3 hours or more. • The wet well would be covered with netting or metal grating and/or construct a barrier around the equipment to keep birds out. • The secondary clarifier (final clarifier) would be covered with netting not to exceed 0.75-inch mesh diameter. MCBH may evaluate using bird balls as a possible secondary additional deterrent measure. The primary clarifier would not be covered as Hawaiian Stilts are not typically found there. Deterrents, such as those mentioned above, may be used at the clarifiers. • Storm water detention basins would be covered in a manner to avoid attracting birds.	Construction, Operations
Construction Surveys for Biological Resources	Minimize disturbance to sensitive species	Surveys for special-status species with the potential to occur would be conducted daily by a qualified biologist. The biologist would identify what species are in the area, where they are located, determine if any nesting is occurring, and share this information with the contractors and facility operators to prevent injury or death to wildlife. A biological monitor would conduct nest surveys in the existing trees at each site	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		and within 100 feet of the proposed project sites. Nest surveys would be repeated within 3 days of project initiation and after any subsequent delay of work of 3 or more days. If a nest or active brood is found: • MCBH Natural Resources staff would contact the USFWS within 48 hours for further guidance. • MCBH would establish a 50-foot buffer zone surrounding the nest and limit actions within the buffer that may harass, haze, intimidate, injure, or kill the nesting bird, eggs, or chicks by restricting access within the buffer to all base personnel and contractors. If the 50-foot buffer is not sufficient to prevent disturbance to a nesting stilt, the USFWS would be consulted to determine how far to extend the buffer; construction outside the buffer area can be performed without limitations. Should the 50-foot buffer not be practical or effective considering the small footprint of the WRF, mitigations such as erecting a temporary fence that isolates the bird from construction activity may be implemented upon approval from USFWS and ECPD Natural Resources staff. • After hatching, a biological monitor would be on-site during construction until chicks have fledged. The biological monitor would advise the contractor and facility operators that chicks are active in the work area. • If a Pueo is spotted on the ground during pre-construction surveys, a nest survey would commence within 200 meters of the observed Pueo. If a nest is discovered, a 200-meter buffer would be erected to protect the nest (Price Lab 2022).	
Vegetation Maintenance	Minimize attractants for birds	Vegetation at the WRF would be maintained at a height not to exceed 3 inches within all landscaped regions, and all vegetation would be removed from within sludge beds.	Construction, Operations
Vegetation Trimming/Removal	Minimize disturbance to sensitive species	Removal, pruning, or trimming of trees and vegetation during bird nesting and bat pupping seasons would be avoided. • To the maximum extent practicable, tree trimming activities would avoid the peak White Tern egg-laying months (March and October) and nest surveys would be conducted prior to tree disturbance. If the tree scheduled for removal, pruning, or trimming is found to contain a nest, the tree would not be disturbed until the chicks have fledged.	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		• No pruning or trimming of trees and vegetation 15 feet or greater would occur during the Hawaiian hoary bat pupping season (June 1–September 15). If a bat is detected, tree trimming would not commence within 100 feet of the known roosting sites. If vegetation removal is proposed during the pupping season, consultation with USFWS is required.	
Lighting	Bird/bat disorientation/fallout	MCBH is striving to incorporate wildlife-friendly lighting associated with existing lighting and with projects requiring new, repaired, or upgraded lighting (MCBH, 2022). Lighting would follow the rule–keep it low, long, and shielded. All lighting would meet the following minimum criteria unless otherwise determined by critical mission requirements: • Install light fixtures as low as possible to the ground. • Use long wavelength (greater than 560 nanometers) light sources. • Shielded, downward directed, and full cutoff so that the lamp or glowing lens is not visible from the side or above. Uplighting is prohibited. • Controlled. Only be "On" when needed. 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. Use the lowest wattage or lumen output necessary for the needed purpose and personnel safety. This would conserve energy and reduce harmful effects to plants, animals, and people. • Use full cutoff downward/shielded bollards in parking areas and sidewalks, and full cutoff downward/shielded wall packs for walkways and entrances/exits. • Minimize the height of pole lighting–15 feet in height or lower where possible. Night work would be minimized during proposed construction to the greatest extent possible. If night work occurs, the following measures would be implemented: • Night lighting would be shielded, directed downward, use motion detectors or other automatic controls, and use the lowest possible	Construction

BMP/Conservation Measure	*Effects Reduced/Avoided*	*Description*	*Applicability*
		lumens. The necessary amount of exterior light would be determined for safety purposes. • Contractor would notify the MCBH Environmental Division in advance of any night work and would be briefed on wildlife concerns (e.g., seabird fallout) and minimization measures. • If a downed seabird is observed, contractors would contact the MCBH Environmental Division immediately to report the observation. • Limit use of lights for activities during the seabird fledging period (September–December), especially during new moon phases.	
Noise	Reduce noise disturbance to birds and bats	Limit nighttime construction work, and where possible, install sound barriers around generators or implement other applicable technologies to mitigate noise.	Construction
Speed Limit	Reduce risk of wildlife strike	Maintain a 5 mile per hour speed limit within the project areas to include the driveway that provides access to the WRF back entrance.	Construction, Operations
Sludge Bed Barriers	Reduce risk of nesting in sludge beds	The sludge beds would be kept free of vegetation to make the beds less inviting to Hawaiian Stilts for nesting. Should Hawaiian Stilts nest in the drying beds, the biological monitor would implement an appropriate stand-off distance to avoid disturbing the nesting birds, and the sludge beds would not be used until the chicks have hatched, fledged, and left the area. MCBH would avoid putting sludge into the sludge beds from May through July to reduce the likelihood of Hawaiian Stilts utilizing the area as a nesting site. Once the new redundant facility is constructed, the sludge beds would only be used as a backup if equipment failure requires diverting digester material.	Operations
Fencing	Minimize access for birds	Install a 2-foot silt fencing barrier at the base exterior of all new and existing fencing around the WRF perimeter to reduce risk of chicks entering the property from adjacent wetland.	Construction

Legend: BMP =Best Management Practice; BO = Biological Opinion; CLEO = Conservation Law Enforcement; ECPD = Environmental Compliance and Protection Division; ESA = Endangered Species Act; LID = Low Impact Development; MCBH = Marine Corps Base Hawaii; MS4 = Municipal Separate Storm Sewer System; SHPO = Hawai'i State Historic Preservation Officer; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service; WRF = Water Reclamation Facility.

Source: MCBH, 2024c.

3 Affected Environment and Environmental Consequences

This chapter presents a description of the existing environment and an analysis of the potential direct and indirect effects of Alternative 1 and the No-Action Alternative (cumulative effects are presented in Chapter 4). The affected environment is the construction footprint at the WRF at MCBH Kaneohe Bay, west of the main WRF entry gate and southeast of the marina. The level of detail and analysis for each resource varies with the level of potential environmental effect.

Significant effects are defined for NEPA in 40 C.F.R. Section 1508.1mm as "adverse effects that an agency has identified as significant based on the criteria in Section 1501.3(d) of this subchapter." These criteria include the context of the action and the intensity of the effect. Context is associated with the location or region of influence (ROI) for the proposed action, which varies among resource areas. Intensity refers to the severity of the effect.

Environmental effects carried forward for more detailed analysis in this EA are noise, air quality, water resources, cultural resources, terrestrial biological resources, utilities, and transportation. Potential effects to the resource areas described below are negligible or nonexistent and, therefore, not carried forward for further analysis in this EA.

Geological Resources. The proposed action would require modification to and construction of new infrastructure on MCBH as described in Section 2.1.2. All construction would be in areas that are developed or have been previously disturbed. For construction within landscaped areas, proposed construction would be implemented on soils that have slow runoff, high permeability, and low erosion potential. Construction would be subject to the NPDES storm water permit, NPDES Construction General Permit Conditions, and site-specific Storm Water Pollution Prevention Plans (SWPPPs) specifically designed to minimize erosion and soil loss. Project design and construction engineering control BMPs, such as erosion socks, erosion control blankets, silt fencing, and fiber rolls, would further reduce any potential for erosion, minimize sedimentation, reduce the flow of storm water, and minimize the transport of soils and sediment off-site. As such, there would be no effects to geological resources. For these reasons, geological resources are not evaluated further in this EA.

Hazardous Materials and Waste. Construction activities would result in a short-term increase in the use of hazardous materials that would cease at the completion of construction. The hazardous materials to be used are common to construction and include such items as diesel fuel, gasoline, and propane to fuel the construction equipment; hydraulic fluids, oils, and lubricants; welding gases; paints; solvents; adhesives; and batteries. All hazardous materials would be handled and disposed of per applicable regulations and consistent with other construction projects at MCBH Kaneohe Bay. This includes hazardous materials from facilities demolition/renovation activities, such as lead and asbestos, should these be encountered during construction. These materials, if encountered, would be taken by licensed transporters and disposed of in permitted landfill facilities in accordance with applicable federal, state, and local laws and regulations. Adherence to applicable BMPs and SOPs during construction would reduce the likelihood and volume of accidental releases, allow for accelerated spill response times, and enable timely implementation of cleanup measures, thereby minimizing potential effects to the environment. Hazardous materials associated with construction activities and operation of the WRF following the upgrade would be delivered and stored in a manner that would prevent these materials from leaking, spilling, and potentially polluting soils and ground and surface waters and in accordance with applicable federal, state, and local regulations. Public transportation routes would be utilized for the conveyance of hazardous materials to the construction site. Transportation of all materials would be

conducted in compliance with U.S. Department of Transportation regulations. For these reasons, hazardous materials and waste are not evaluated further in this EA.

Marine Biological Resources. The proposed action does not include in-water construction or operation. ESA-listed marine species do not haul out on the shoreline adjacent to the WRF. The proposed action does not change the potential for in-water effects to marine species. For these reasons, effects to marine biological resources are not further analyzed in this EA.

Socioeconomics. Construction personnel would come from the existing population on Oʻahu, so the proposed action would result in no changes to populations outside the base, with no corresponding effects to employment or industry characteristics; demand for schools, housing, and recreational facilities; or changes to the demographic, economic, and fiscal environment of Kailua, Kāneʻohe, and the County of Honolulu. Construction is expected to last from 2025 through 2028, and the total construction cost is currently estimated at approximately $319 million (NAVFAC Hawaii, 2024). Therefore, proposed construction may provide some minor, temporary beneficial effects to the local economy from construction-related jobs and purchasing, but no long-term increase in employment would result. It is assumed the expenditures would occur evenly over the construction period. The proposed action would add five additional permanent personnel, which would be a negligible change in the overall number of MCBH Kaneohe Bay personnel. For these reasons, socioeconomics is not further analyzed in this EA.

Public Health and Safety. The proposed construction would occur entirely on Marine Corps property at MCBH Kaneohe Bay where public access is allowed only under very limited circumstances. The proposed action does not change these restrictions or affect public access. Construction would occur solely in operational areas on base, with no disturbance to residential areas. All sites would be secured and monitored during non-work hours. The WRF currently discharges to an ocean outfall that is also used by the Kailua Regional Wastewater Treatment Plant. With the improved functions at the WRF, effluent water would continue to remain below the limits set by the NPDES wastewater permit, and the potential for pollutants to enter Kailua Bay would decrease. The DOH would continue to provide advisory notices if discharges to the municipal outfall exceed permitted levels. Treated effluent at the municipal pipeline discharge location would continue to meet federal and state standards, so no public safety issues would occur for Kailua Bay. In addition, the proposed action includes integration of tsunami design components to minimize potential effects to the WRF during tsunami events. Therefore, public health and safety is not evaluated further in this EA.

Land Use. MCBH Kaneohe Bay is an existing military installation, and all proposed construction and operation would occur within base boundaries and be consistent with the military mission. No new land uses would result from the proposed action. Proposed upgrades would occur at and be consistent with the existing activities at WRF, resulting in no change to land use at the WRF. Therefore, land use is not evaluated further in this EA.

Recreation. The proposed construction would occur entirely on Marine Corps property at MCBH Kaneohe Bay where public access is allowed only under very limited circumstances. The proposed action does not change these restrictions or affect public access. The WRF currently discharges to a pipeline that is also used by the Kailua Regional Wastewater Treatment Plant. Construction actions would be confined to previously developed areas at the WRF and would not have any effects to recreational activities on or off base. Therefore, recreation is not evaluated further in this EA.

3.1 Noise

Noise is generally defined as unwanted sound that can interfere with normal activities and/or otherwise diminishes the quality of the natural environment. Noise may be intermittent or continuous, steady or impulsive, and stationary or transient. Stationary sources are normally related to specific land uses, such as an amusement park or industrial plant. Transient noise sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flight tracks around airports), or randomly. Responses to noise vary according to the type of noise and the characteristics of the sound source, the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal). This section analyzes effects to human receptors; effects to wildlife are addressed in Section 3.5, *Terrestrial Biological Resources*.

The physical characteristics of noise include its intensity, frequency, and duration. The large variation in sound intensities affecting humans range from a soft whisper to a jet engine resulting in sound levels typically presented using a logarithmic scale. The unit used to measure the intensity of sound is the decibel (dB) and human hearing ranges from approximately 20 A-weighted decibels (dBA) (the threshold of hearing) to up to 120 dB (the threshold at which sound causes physical discomfort).

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

The duration of a noise event and the number of times it occurs are also important considerations in assessing noise effects. For example, at approximately 3 feet, sound from normal human speech ranges from 63 to 65 dBA, operating kitchen appliances range from about 83 to 88 dBA, and rock bands approach 110 dBA (Cowan, 1994). A difference of 3 dBA represents a doubling of sound level in terms of energy.

The human response to noise can vary according to the type, source, number of events, and distance between the source and the receptor. From a physical standpoint, there is no distinction between noise and desired sound, as both consist of vibrations through air. The distinction arises from the brain's perception of the sound as wanted, expected, or pleasant, as opposed to "noise," which is perceived as unpleasant, loud, disruptive, or annoying to hearing. "Annoying" in this instance is defined by the EPA as any negative subjective reaction on the part of an individual or group in response to "noise" (EPA, 1974).

Day-night average sound level (DNL) is the primary method utilized by the DoD for assessing long-term environmental noise, which is the sound level measured over a 24-hour period. The DNL defines two time periods of measurement: "Daytime" from 7:00 a.m. to 10:00 p.m. local time and "Nighttime" from 10:00 p.m. to 7:00 a.m. (often referred to as "DNL nighttime"). DNL weights noise events occurring between 10:00 p.m. and 7:00 a.m. with a 10 dBA adjustment equivalent to 10 times the number of noise events (DoD, 2020). The adjustment accounts for the added intrusiveness of noise events affecting people during the DNL nighttime period. Most people are routinely exposed to sound levels of 50 to 55 DNL or higher (Federal Interagency Committee on Urban Noise, 1980). The DoD has adopted 65 dBA DNL as the threshold for potential land use incompatibility (DoD, 2021). Areas exposed to less than 65 dBA DNL are considered compatible for all land uses.

3.1.1 Affected Environment

The affected environment describes the existing conditions for noise sources currently experienced at MCBH Kaneohe Bay. The WRF is located at the southern end of MCBH Kaneohe Bay, near an industrial setting with a variety of existing noise sources. The primary on-site noise sources are typical of Marine Corps air installations and include aircraft operating at the airfield, training activities at installation ranges, and vehicle traffic on base roadways. The WRF is 0.5 mile from the 65 dBA DNL contour surrounding the airfield, so the average noise level is lower than 65 dBA.

The closest on-base noise-sensitive receptors to the WRF are housing and a school 0.5 mile away. The closest off-base noise-sensitive receptors are the residences located to the south in Kāneʻohe at approximately 0.6 mile from the WRF.

3.1.2 Environmental Consequences

Analysis of potential noise effects includes assessing noise levels that would occur from the proposed action and determining their potential effects to noise-sensitive receptors.

A reference table of anticipated maximum sound levels that could be generated from the proposed construction activities was made utilizing the Federal Highway Administration's Road Construction Model. Demolition, renovations, and construction would include several common pieces of construction equipment, such as clam shovel, concrete saw, compactor, dozer, excavator, jackhammer, generator, and dump truck. Details of the estimated maximum A-weighted sound level (L_{max}) at 50 feet from the source are summarized in Table 3.1-1. As the distance increases between the construction equipment source and the receiver, the L_{max} decreases.

Table 3.1-1 Estimated Maximum Sound Levels of Construction Equipment at Kaneohe Bay

Equipment Description	L_{max} *@ 50 ft (dBA)*
Clam Shovel	93
Concrete Saw	90
Compactor	80
Dozer	85
Excavator	85
Jackhammer	85
Generator	82
Dump Truck	84

Legend: ft = foot/feet; dBA = A-weighted decibel; L_{max} = maximum sound level.
Source: Federal Highway Administration, 2006.

3.1.2.1 No-Action Alternative

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

3.1.2.2 Alternative 1

Construction

The proposed demolition, renovations, and construction within the WRF would result in short-term, intermittent noise effects from the operation of heavy equipment, power and hand tools, and

construction vehicles. Construction would occur sporadically throughout daytime hours; nighttime construction (during the hours of 10:00 p.m. to 7:00 a.m.) would be minimized to the greatest extent possible.

The proposed construction footprint is entirely within operational areas of the WRF, which is already subject to and generates industrial noise. All construction would be consistent with existing noise onboard MCBH Kaneohe Bay. HAR Chapter 11-46, *Community Noise Control*, specifies acceptable noise levels for a Class A zoning district (equivalent to lands zoned for residential, conservation, or public space) to be 55 dBA during hours of 7:00 a.m. to 10:00 p.m. (DOH, 1969). The rule further states that "[n]oise levels shall not exceed the maximum permissible sound level for more than ten percent of the time within any twenty-minute period, except by permit or variance." While construction noise levels can exceed these levels, such noise levels (Table 3.1-1) decrease to 54 dBA at 500 feet. As both on- and off-base noise-sensitive receptors are located significantly farther away from the proposed construction at WRF (0.5 to 0.6 mile away) than 500 feet, they would not be affected. Therefore, Alternative 1 construction would have less than significant noise effects.

Operations

Proposed operations at WRF would be similar to existing WRF operations. The new equipment and facilities would reside entirely within the existing WRF footprint and be similar to existing WRF equipment and facilities, generating similar noise levels. Therefore, Alternative 1 operations would have less than significant noise effects.

3.2 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). The concentration of various pollutants in the atmosphere defines the air quality in a region or at a specific location. Many factors influence a region's air quality, including the type and quantity of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Most air pollutants originate from human-made sources, including mobile sources (e.g., aircraft, cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Natural sources, such as volcanic eruptions and forest fires, also release pollutants into the air.

Under the Clean Air Act, the EPA established National Ambient Air Quality Standards (NAAQS) (40 C.F.R. Part 50) for six criteria air pollutants, including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide (SO_2), lead, and particulate matter with diameters less than or equal to 10 and 2.5 micrometers. The EPA classifies NAAQS as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. The EPA designated short-term standards to protect against acute health effects and established long-term standards to protect against chronic health effects.

The EPA designates areas in compliance with the NAAQS as attainment areas. The EPA designates areas that have transitioned from nonattainment to attainment as maintenance areas; these areas must adhere to maintenance plans to ensure continued attainment. The Clean Air Act requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated as nonattainment. State and local air quality management agencies develop these plans, known as State Implementation Plans, and submit them to the EPA for approval.

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

3.2.1 Affected Environment

The air quality ROI includes the east side of the island of O'ahu in Honolulu County, where MCBH Kaneohe Bay is located, and the State of Hawai'i for GHGs and natural hazards effects. The latest 2022 data from the DOH indicates the state is in attainment except for exceedances for SO_2 in communities near the volcano on Hawai'i Island (DOH, 2024; EPA, 2023a), which the EPA considers as a natural, uncontrollable event. Because the state is in attainment of the NAAQS, it is not subject to the Clean Air Act's General Conformity Rule.

Emission sources in operation at MCBH Kaneohe Bay generally include fuel combustion by aircraft engines and motor vehicles, boilers, and generators.

3.2.2 Environmental Consequences

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

3.2.2.1 No-Action Alternative

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

3.2.2.2 Alternative 1

Because the State of Hawai'i is in attainment of the NAAQS, the proposed action is not subject to the Clean Air Act General Conformity Rule.

Construction

Construction activities during implementation of the proposed action would generate short-term, temporary air emissions such as fugitive dust and combustion of fossil fuels from construction equipment. The proposed construction activities would occur over 3 years. Estimates of construction equipment emissions were based on the estimated hours of usage and emission factors for each anticipated mobile source. This analysis evaluated nitrogen oxides, volatile organic compounds, carbon monoxide, particulate matter with diameters less than or equal to 10 and 2.5 micrometers, SO_2, and GHGs in terms of carbon dioxide equivalent (CO_2e) related to heavy-duty diesel equipment and on road trucks and commuter vehicles from the EPA's Motor Vehicle Emission Simulator emission factor model (EPA, 2023b). The earth disturbance-related fugitive dust emissions were estimated based on the areas with potential ground disturbance and EPA AP-42 particulate matter emission factors. Table 3.2-1 summarizes the predicted annual construction emissions under Alternative 1 and detailed air emissions calculations are presented in Appendix F.

Table 3.2-1 Alternative 1 Construction Activity Air Emissions Inventory

Year	*Emission (tons)*						
	VOC	*NO_x*	*CO*	*$PM_{2.5}$*	*PM_{10}*	*SO_2*	*CO_2*
2026	0.02	0.30	0.26	0.16	1.52	0.001	181.63
2027	0.02	0.30	0.26	0.16	1.52	0.001	181.63
2028	0.02	0.30	0.26	0.16	1.52	0.001	181.63

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM = particulate matter (PM_{10} and $PM_{2.5}$ are particles with aerodynamic diameters less than or equal to a nominal 10 and 2.5 micrometers, respectively); SO_2 = sulfur dioxide; VOC = volatile organic compound.

The prevailing northeast trade winds around MCBH Kaneohe Bay disperse air pollutants. Dust BMPs, such as regular watering, the temporary nature of the effects, and the distance to downwind sensitive receptors (0.5 to 0.6 miles away) would also lessen the effects of ground-level release, dispersion, and transport of air pollutant emissions. All construction activities would comply with the provisions of HAR 11-60.1-33, *Fugitive Dust*. For these reasons, Alternative 1 construction would have less than significant effects to air quality. Effects due to GHG emissions are analyzed in Section 4.4, *Cumulative Effects*.

Operations

Proposed operations at WRF would be similar to existing WRF operations because only one effluent treatment system would be used at any given time. The new equipment and facilities would be similar to existing WRF equipment and facilities, generating similar air levels. Therefore, Alternative 1 operations would have less than significant effects to air quality. Effects due to GHG emissions are analyzed in Section 4.4, *Cumulative Effects*.

3.3 Water Resources

Water resources include marine waters, groundwater, surface water, wetlands, and floodplains. This section identifies the existing condition of water resources and analyzes the effects of the proposed action on those resources. The affected environment for water resources consists of the construction footprint at MCBH Kaneohe Bay WRF and the immediate marine waters of Kāneʻohe Bay and Kailua Bay. Potable water usage and distribution are discussed in Section 3.6, *Utilities*.

3.3.1 Affected Environment

A description of water resources is presented below for MCBH Kaneohe Bay. The ROI for water resources includes marine waters, groundwater, surface water, wetlands, and floodplains at and immediately surrounding the WRF and at Klipper Golf Course where recycled water can potentially be used. Because construction is proposed at MCBH Kaneohe Bay, the description of the affected environment for that location contains floodplain data.

3.3.1.1 Marine Waters

HAR 11-54, *Water Standards*, classifies Kailua Bay and Kāneʻohe Bay as marine water quality Class AA (DOH, 2021b). Fresh water enters the ocean from rainfall, intermittent small streams, and surface drainage from MCBH Kaneohe Bay and the communities of Kailua and Kāneʻohe. Water in shallow areas mixes slowly with deeper waters of the bay (Kāneʻohe Bay Information System, 2022). Freshwater mixing occurs more in the winter; during the summer, fresh water remains at the surface. Marine water quality is affected by several parameters, including nutrient levels, turbidity, salinity, and microbial content, which are critical for sustaining marine life and ensuring the health of the ecosystem. MCBH Kaneohe Bay uses the municipal ocean outfall east of the base under the NPDES wastewater permit (October 2024). Water quality samples are regularly collected at seven shoreline stations in Kailua Bay near the Kailua Regional Wastewater Treatment Plant and posted online (City and County of Honolulu, 2025).

Groundwater results from the infiltration of water through surface soils and permeable rock materials. The Mōkapu Peninsula's thin layer of surface soil, combined with its layer of rock and sediments, provide little depth for groundwater drainage. Groundwater resources at Mōkapu Peninsula 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.

3.3.1.2 Surface Water

Surface water resources generally consist of ponds, lakes, rivers, and streams. The WRF is located within the Koʻolaupoko watershed (a 65-square mile watershed subdivided into 19 sub-watersheds) and specifically within the Puʻu Hawaiʻiloa sub-watershed. Rainfall averages 40 inches per year (Rainfall Atlas of Hawaiʻi, 2024). There are no freshwater surface waters at the WRF. The Nuʻupia Ponds Complex is an estuarine system 0.2 mile from the WRF. Storm water runoff from inland areas of Mōkapu Peninsula (including Klipper Golf Course) flows south to the Nuʻupia Ponds Complex, ultimately connecting to Kāneʻohe Bay. Storm water outfalls at MCBH Kaneohe Bay are regulated under the MS4 permit as outlined in the Storm Water Management Plan (MCBH, 2023a).

3.3.1.3 Wetlands

Eight protected wetland complexes are located at MCBH Kaneohe Bay: (1) Hale Koa Wetland; (2) Sag Harbor Wetland; (3) Salvage Yard Wetland; (4) Percolation Ditch Wetland; (5) Motor Pool Wetland; (6) Kāneʻohe Klipper Golf Course Ponds; (7) Temporary Lodging Facility Wetland; and (8) Nuʻupia Ponds Complex, a designated and protected Wildlife Management Area containing endangered flora and fauna. The Salvage Yard Wetland and the Nuʻupia Ponds Complex are adjacent to the WRF. Operations at the WRF do not impede wetland functions and resources.

3.3.1.4 Floodplains

There are two types of flood-designated areas at MCBH Kaneohe Bay: flood zones designated by the Federal Emergency Management Agency (FEMA), which are shown in Flood Insurance Rate Maps, and floodplains specific to the Mōkapu Central Drainage Channel. The WRF is in FEMA Zone D, an area where flood hazards are possible, but undetermined (Figure 3.3-1). Coastal regions adjacent to the WRF to the west and north are in FEMA Zones VE (1 percent or greater annual chance of coastal flooding and an additional hazard of storm waves), and AE (1 percent annual chance of flooding). Portions of the ROI are within the Tsunami Evacuation Zone.

Box culverts west of the WRF drain the runway area southward into Kāneʻohe Bay. In addition, a narrow center portion of the base covering an area east of G Street to Craig Avenue is drained by a channel discharging southward into Kāneʻohe Bay.

3.3.2 Environmental Consequences

This analysis focuses on the potential effects of the proposed action on marine waters, groundwater, surface water, wetlands, and floodplains. Groundwater analysis focuses on the potential for effects to the quality, quantity, and accessibility of groundwater, and marine and surface water quality considers the potential for effects to improve or degrade current water quality. The assessment of wetlands considers the potential for effects to the hydrology, soils, and vegetation that support a wetland. The analysis of floodplains considers whether the project may impede the functions of floodplains and drainage systems in conveying floodwaters.

3.3.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. This would result in an increased potential for discharges to occur that do not meet water quality standards and permit requirements for operation of the existing WRF. As a result, the No-Action Alternative would potentially adversely affect water resources.

3.3.2.2 Alternative 1

Construction

The proposed construction at the WRF would not significantly affect marine water quality during the construction period. With implementation of BMPs, including sediment barriers, storm water management systems, and spill containment protocols (see Table 2.2-1), effects to marine waters would be avoided. The Marine Corps would obtain NPDES general permit coverage for the proposed action under the State of Hawaiʻi general permit for discharges of storm water associated with construction activities.

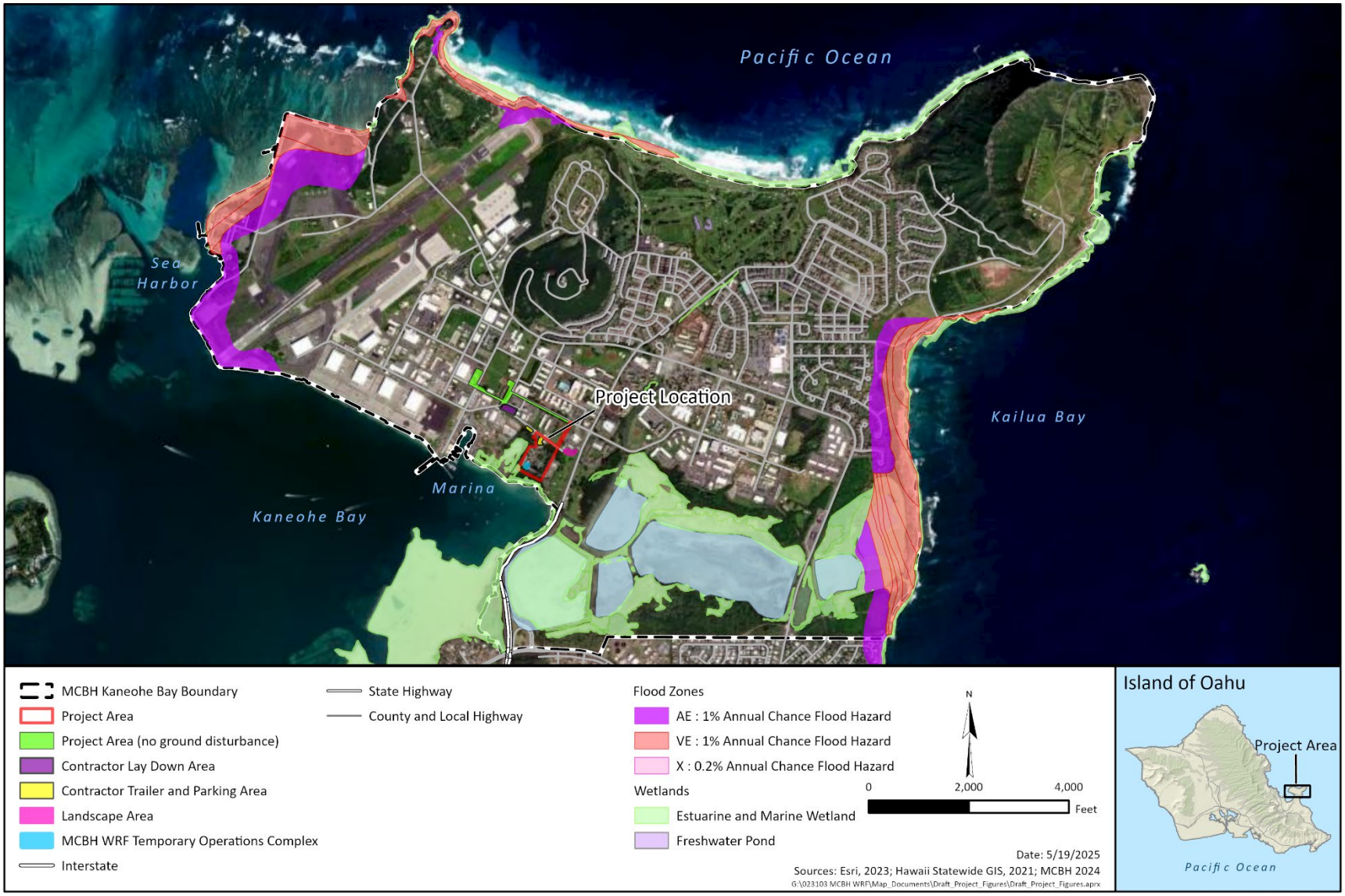


Figure 3.3-1 Water Resources and Flood Zones at MCBH

The construction project would take place near the Salvage Yard Wetland and the Nu'upia Ponds Complex. Although these two wetlands are adjacent to the WRF, no construction would occur beyond the WRF property. BMPs in Table 2.2-1 such as filter socks, storm water Low Impact Development (LID) techniques (e.g., bio-retention and vegetated swale/filter strips) would ensure that sediment deposition and sediment runoff does not affect the nearby wetland environments. In addition, if the opportunity arises in the future, there could potentially be a diversion overland flow of water to the Salvage Yard Wetland to enhance water flow to the wetland (see Table 2.2-1).

Alternative 1 construction would have no effects to groundwater and drinking water because there are no potable water wells on the base.

Alternative 1 would include approximately 3.0 acres of ground-disturbing activities. Much of this construction will occur in previously disturbed portions of the existing WRF footprint, resulting in impervious surface area similar to what currently exists. The proposed construction would occur in compliance with the MS4 permit (MCBH, 2023a), which includes authorized storm water and non-storm water discharges. The MS4 permit would include the development of a site-specific construction SWPPP and a Notice of Intent under Appendix C from DOH. The SWPPP would identify BMPs, such as runoff detention basins and silt fencing, to reduce the potential for contaminants to be transported off-site. Application of conservation measures would further minimize runoff. Removed materials, debris, and soil resulting from construction activities would be contained and disposed of in accordance with applicable regulations.

Coastal regions to the west and the east of the WRF are in FEMA flood zones. The proposed action would provide additional protection against flooding because it would be designed to meet tsunami requirements. The construction projects at the WRF are outside of the floodplains identified by FEMA (see Figure 3.3-1).

For these reasons, Alternative 1 construction would have less than significant effects to water resources.

Operations

The upgraded WRF would improve the quality and reduce the amount of the wastewater discharging into the municipal outfall. The wastewater that is ultimately discharged into marine waters would continue to meet permit requirements, including during maintenance events as a result of the new redundant system.

The WRF location has no effect on drinking water because there are no potable water wells on base. The improved functions and facilities at the WRF would continue to not impede groundwater resources. MCBH Kaneohe Bay coordinates with the City and County of Honolulu Board of Water Supply regarding drinking water use. Potable water usage and distribution are discussed in Section 3.6, *Utilities*.

The operations at the WRF would not impede wetland functions and resources. The facility's upgrades focus on improving effluent treatment and redundancy, which can assist in reducing any potential pollutants into the nearby wetland regions. Once the proposed construction and renovation projects become operational, the proposed facilities and new impervious surfaces would continue to generate storm water runoff. The Storm Water Management Plan addresses runoff from industrial sites into Kāne'ohe Bay, Nu'upia Ponds, Kailua Bay, and the Mōkapu Central Drainage Channel and identifies approved storm water management procedures and design features consistent with the MS4 permit and EPA Federal Facility Compliance Agreement requirements. All new facilities would implement LID elements and appropriate BMPs to maintain storm water discharges to pre-development hydrologic

conditions, and the storm water pollution control measures would comply with the MS4 permit. LID techniques include bio-retention and vegetated swale/filter strips to minimize potential sediments entering the wetlands so that additional runoff would be minimized, and that predevelopment hydrology is maintained. Storm water runoff from the WRF area would continue to flow south to the Nuʻupia Ponds Complex and into Kāneʻohe Bay. The impervious surface area at the upgraded WRF would be similar to the amount at the existing WRF, so the storm water drainage flows and volumes would be similar to the existing WRF. The project design features in Table 2.2-1, including bioretention, vegetated swales, and pervious pavement, are designed to manage storm water volumes to prevent any potential flooding or ponding in the ROI. Additional storm water outfalls would not be needed for the proposed action, so there would be no change to the MS4 permit.

The proposed action would result in the ability to reuse R-1 level water at the WRF and the Klipper Golf Course, reducing the overall water demand from the City and County of Honolulu Board of Water Supply and the amount of effluent discharged to the municipal outfall. The R-1-quality recycled water would meet higher treatment and application standards than R-2 recycled water. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Therefore, there would be no degradation of water quality through irrigation of the Klipper Golf Course with R-1 quality recycled water. Additional analysis of potable water is presented in Section 3.6, *Utilities*.

The WRF is outside of the floodplains identified by FEMA (see Figure 3.3-1). Therefore, there would be no effects to floodplains.

For these reasons, Alternative 1 operations would have beneficial but less than significant effects to water resources.

3.4 Cultural Resources

Cultural resources are the physical evidence or places of current and past human activity. Cultural resources can include historic properties that consist of buildings, structures, objects, districts, and sites that are listed in or eligible for listing in the National Register of Historic Places. Historic properties can include archaeological and architectural resources. Archaeological resources are generally sites where human activity measurably altered the earth and/or left deposits of physical remains. Architectural resources include standing buildings, structures, and other built-environment resources of historic or aesthetic significance. Cultural resources can also include Native American Graves Protection and Repatriation Act (NAGPRA) cultural items as defined in Section 3001 of title 25, U.S.C. (NAGPRA); Native Hawaiian sacred sites as defined in Executive Order (EO) 13007, *Indian Sacred Sites*, May 24, 1996; archaeological resources as defined in section 470 aa-mm of Title 16, U.S.C. (Archaeological Resources Protection Act); archaeological artifact collections and associated records as defined in 36 C.F.R. 79 (Curation of Federally Owned or Administered Archeological Collections); and DoD Instruction 4712.16.

3.4.1 Affected Environment

The affected environment for cultural resources is based on the area of potential effects (APE) of an NHPA Section 106 undertaking through consultation with the SHPO. An APE is defined in 36 C.F.R. Section 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE encompasses new construction and landscaping; construction laydown areas and building demolitions; renovations and modifications; and the locations of where new buildings or structures could potentially detract from the integrity of setting and feeling of cultural resources through visual, audible (noise), or atmospheric changes. The location of the APE is shown in Figure 3.4-1.

There are no known NAGPRA cultural items located within the APE. No Native Hawaiian sacred sites have been identified within the APE during prior consultation with Native Hawaiian Organizations. Therefore, these resources will not be analyzed in this EA.

3.4.1.1 Historical Background

Detailed historical backgrounds for MCBH Kaneohe Bay are found in the MCBH Integrated Cultural Resources Management Plan (ICRMP) (Tomonari-Tuggle and Clark, 2021) in Appendix C.

Figure 3.4-1 Cultural Resources and the Area of Potential Effects

3.4.1.2 Archaeological Resources

MCBH has conducted numerous inventories of archaeological resources at MCBH Kaneohe Bay identifying properties and determining their eligibility for listing in the National Register of Historic Places. The results of these studies are summarized in MCBH's ICRMP (Tomonari-Tuggle and Clark, 2021), and *Cultural Landscape Report* (MCBH, 2018). There have been more than 240 cultural resource projects undertaken at MCBH Kaneohe Bay. These projects include archaeological surveys, inventories, monitoring, historical architectural inventories and documentation, cultural landscape reporting, and historical and interpretative projects. See Figure 3.4-1 for generalized locations of archaeological resources. Through the results of these studies, Cultural Resource Management Zones and a model of archaeological sensitivity (Tomonari-Tuggle and Clark, 2021: II–86) have been developed. Within each Cultural Resource Management Zone, archaeological sensitivity varies based on: (1) an analysis of known site distribution combined with the study of historical settlement/land use and environmental factors to develop a model of pre-contact and early historic settlement patterns; (2) historic and modern development that would have affected site preservation (e.g., landfills, areas where sand has been mined and/or used as fill, dredged areas, ordnance target areas); and (3) areas that have been previously investigated and found to not contain archaeological sites (Tomonari-Tuggle and Clark, 2021). Figure 3.4-2 depicts the MCBH Kaneohe Bay archaeological sensitivity map. The majority of the APE is located on reclaimed land created during the World War II era using dredged fill material from Kāneʻohe Bay. Therefore, the archaeological sensitivity of this area (Figure 3.4-2) has been identified in the ICRMP as an area with "no archaeology remains." The area proposed for trenching for new duct banks north of the WRF site is located within a "low" probability area, and previous archaeological studies confirm this area is largely composed of man-made fill. These studies recorded no evidence of subsurface archaeological deposits or sites.

In addition to known archaeological resources and the modeled archaeological sensitivity areas, disturbed human remains have been found in redeposited sand fill at various and random locations throughout the peninsula. In the 1930s and during World War II, sand was mined from the northern dunes (the Mōkapu Burial Area) and human remains were unknowingly transported with the fill sand. This fill typically occurred in utility trenches, under and around building foundations and concrete pads, and has been found in secondary disturbed contexts at the north end of the airfield. For this reason, MCBH has consistently required monitoring of ground-disturbing activities to identify any presence of human skeletal remains and ensure any encountered are treated under conditions agreed upon with Native Hawaiian descendants and organizations (Tomonari-Tuggle and Clark, 2021).

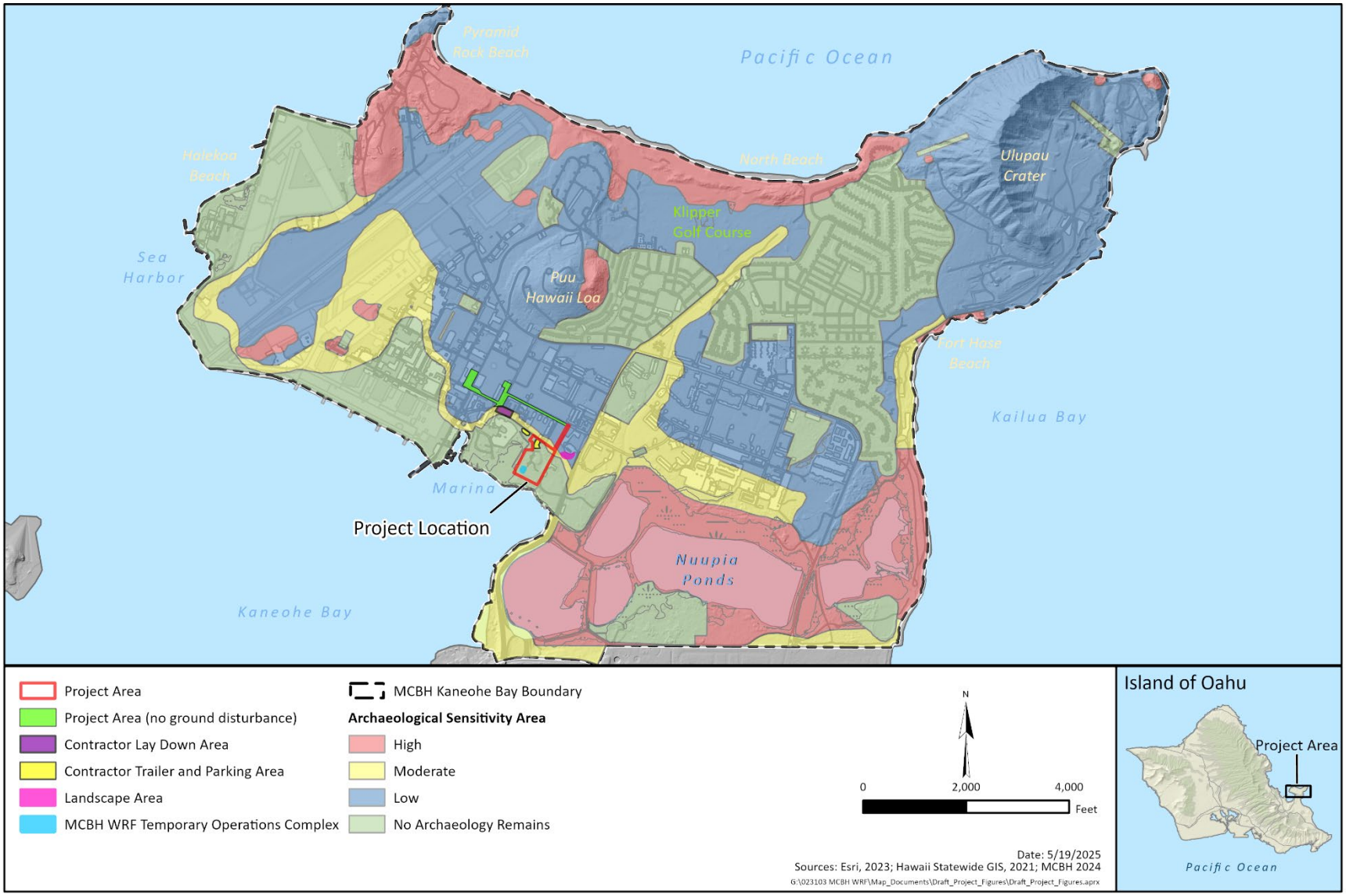


Figure 3.4-2 Archaeological Sensitivity Areas at MCBH Kaneohe Bay

3.4.1.3 Architectural Resources

There are no historic architectural properties, including districts, structures, buildings, objects, and/or subsurface archaeological sites, in the APE for this undertaking (Tomonari-Tuggle and Clark, 2021). The APE is not located within a historic district nor is it visible from a historic district.

3.4.2 Environmental Consequences

NEPA incorporates NHPA analysis of historic properties as part of the overall evaluation of environmental consequences and also addresses environmental effects to all other categories of cultural resources. NEPA and NHPA are separate statutes that evaluate and address effects differently. For example, effects of a proposed action on a historic property can be "adverse" under the NHPA Section 106 without triggering a determination of "significance" under NEPA, and a proposed action that has been determined to result in no adverse effects to historic properties under NHPA Section 106 of the NHPA can rise to the level of "significance" under NEPA for factors other than effects to historical resources.

The analysis of potential effects to historic properties is based on the following considerations: (1) physically altering, damaging, or destroying all or part of a property; (2) altering characteristics of the surrounding environment that contribute to property significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or (4) neglecting the property to the extent it deteriorates or is destroyed.

Under Section 106, adverse effects to historic properties must be resolved through measures that avoid, minimize, or mitigate the effects. Under NEPA, potential effects can be mitigated through avoiding, minimizing, or reducing effects, as well as compensating for effects to the human environment. Mitigation of effects to cultural resources, including historic properties as required by Section 106 and NEPA, can reduce those effects below the threshold of concern for NEPA.

3.4.2.1 No-Action Alternative

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

3.4.2.2 Alternative 1

Construction

Archaeological Resources

Construction projects at the WRF include the following activity types: demolishing existing buildings and structures, constructing new buildings and structures, modifying/renovating buildings, repaving, adding fencing, installing underground utilities within the construction footprints, and staging construction equipment. Proposed communications duct bank trenching would occur in the softball field between the WRF and 3rd Street, (see Figure 2.1-2). The proposed electric feeder cables outside the WRF would utilize an existing conduit and would not involve any ground disturbance. The APE is located in an area of filled land created in the 1940s with no potential for NRHP-eligible archaeological sites to be present. It is possible that human remains were brought into the project area with historic fill sand mined from the northern dunes (the Mōkapu Burial Area). Archaeological monitoring will occur during project-related ground-disturbing activities as a BMP consistent with SOP 6, *Guidelines for NAGPRA Discovery of*

Human Remains, per the MCBH ICRMP (Tomonari-Tuggle and Clark, 2021). The monitoring will be performed in accordance with an archaeological monitoring work plan that would be reviewed and approved by the MCBH Cultural Resource Manager. The Marine Corps will provide the SHPO with an archaeological monitoring report within 90 calendar days from the end of ground-disturbing work (see Table 2.2-1).

For these reasons, Alternative 1 construction would have less than significant effects to archaeological resources.

Architectural Resources

No historic architectural resources would be affected by the construction because no such resources are present within the APE. Therefore, Alternative 1 construction would have no effects to architectural resources.

Operations

As there are no historic structures or known archaeological resources or historic properties within the APE, and the WRF would operate similar to existing conditions, Alternative 1 operations would have no effects to archaeological or architectural resources.

NHPA Section 106 Consultation

In accordance with Section 106 of the NHPA, the Marine Corps coordinated with the Hawai‘i SHPO, Native Hawaiian Organizations, interested parties, and the public regarding a finding of no historic properties affected by the proposed action. The SHPO concurred with this finding with the provision that the Marine Corps will provide the SHPO with an archaeological monitoring report following completion of archaeological monitoring (Appendix C).

3.5 Terrestrial Biological Resources

Terrestrial biological resources include native and introduced 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 the WRF. Biological resources are divided into the following categories: *Vegetation, Wildlife, and Special-status Species.*

- *Vegetation:* Potential project-related effects to existing vegetation may be caused by removal of vegetation during construction, disturbance from vehicle and foot traffic, and indirect sources such as changes to storm water or wastewater volumes and pollutant loads.
- *Wildlife:* Potential stressors to wildlife habitat may include those described above for vegetation and lighting related to construction and operations, nesting/breeding season disturbance, potential wildlife-vehicle or equipment strikes, and changes in the noise environment during construction and operations. Special consideration is given to bird species protected under the Migratory Bird Treaty Act (MBTA) and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds.*
- *Special-status Species* are defined in this EA as species that are listed as threatened or endangered under the 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 effect analysis for Special-status Species in Section 3.5.2).

3.5.1 Affected Environment

Sections 3.5.1.3 and 3.5.1.4 present an overview of federal and state special-status species, respectively, for the ROI, which is the WRF and the surrounding areas on base and over the immediately adjacent nearshore waters of Kaneohe Bay.

3.5.1.1 Vegetation

The ROI consists mostly of modified landscape with little native vegetative communities within the WRF. The WRF is mostly encompassed by non-native and invasive trees such as koa haole (*Leucaena leucocephala*), kiawe (*Prosopis pallida*), ironwood (*Casuarina equisetifolia*), and Christmas berry (*Schinus terebinthifolius*), as well as guinea grass (*Megathyrsus maximus*). Small amounts of native vegetation occur outside the WRF. Other non-native landscape vegetation consists of a variety of fruit trees, mowed open Bermuda grass (*Cyndon dactylon*) surrounding much of the facility infrastructure, and ornamental plants. The western side of the facility is the Salvage Yard Wetland, which is composed of native and non-native wetland-associated vegetation communities such as pickleweed (*Batis maritima*).

3.5.1.2 Wildlife

Wildlife in the ROI includes native and non-native species of birds, reptiles, mammals, and arthropods that are consistent with those species found in a developed and urbanized coastal environment on O‘ahu. Invasive and feral mammalian species in or near the WRF include rats (*Rattus spp.*), cats (*Felis catus*), and mongoose (*Herpestes javanicus*). Several non-MBTA avian species are present within the ROI such as Spotted Dove (*Spilopelia chinensis*), Zebra Dove (*Geopelia striata*), Red-crested Cardinal (*Paroaria coronata*), Warbling White-eye (*Zosterops japonicus*), Common Myna (*Acridotheres tristis),* and Java Sparrow *(Padda oryzivora).*

Many birds present in the Hawaiian Islands and all resident seabirds are protected under the MBTA. Regularly observed MBTA-listed species in the WRF are Black-crowned Night Heron or ʻAukuʻu (*Nycticorax nycticorax*), Pacific Golden Plover or Kōlea (*Pluvialis fulva*), Ruddy Turnstone or ʻAkekeke (*Arenaria interpres*), and Western Cattle-egret (*Ardea ibis*). Other common MBTA-listed species include: Northern Cardinal (*Cardinalis cardinalis*), Sanderling or Hunakai (*Calidris alba*), and Wandering Tattler or ʻŪlili (*Heteroscelus incanus*). Ducks observed in the WRF are the MBTA-listed Mallard (*Anas platyrhynchos*) or hybrids of Hawaiian Duck or Koloa Maoli (*Anas wyvillianas*) with Mallards. MBTA-listed birds that have the potential to occur in the WRF include House Finch (*Haemorhous mexicanus*), Northern Pintail (*Anas acuta*), Northern Shoveler (*Spatula clypeata*), and Black Noddy (A*nous minutus*).

3.5.1.3 Special-status Species – Federal

ESA-listed species with the potential to occur in the ROI are listed in Table 3.5-1 and are identified by their scientific name, common name, Hawaiian name, and regulatory status. The text below provides additional context for the species listed in Table 3.5-1. There is no federally designated critical habitat for any ESA-listed species within the ROI. Given the conservation measures implemented in the 2011 MCBH Integrated Natural Resources Management Plan, National Oceanic and Atmospheric Administration (NOAA) Fisheries determined that the areas subject to the Integrated Natural Resources Management Plan are precluded from Hawaiian monk seal critical habitat (80 *Federal Register* 50925). Proposed critical habitat for the green sea turtle (*Chelonia mydas*) exist just outside of the ROI, beyond the southern edge of the WRF. There are no federal special-status species plants in the ROI.

Table 3.5-1 Special-status Species Known to Occur or with Potential to Occur in the ROI

Scientific Name	*Common Name*	*Hawaiian Name*	*Regulatory Status*
Birds			
Asio flammeus	Hawaiian Short-eared Owl	Pueo	SE*
Gygis alba	White Tern	Manu o Kū	ST
Himantopus mexicanus knudseni	Hawaiian Stilt	Aeʻo	FE, SE
Hydrobates castro	Band-rumped Storm-petrel	ʻAkē ʻakē	FE, SE
Pterodroma sandwichensis	Hawaiian Petrel	ʻUaʻu	FE, SE
Puffinus newelli	Newell's Shearwater	ʻAʻo	FT, ST
Mammals			
Aeorestes semotus	Hawaiian Hoary Bat	ʻŌpeʻapeʻa	FE, SE

Notes: Selections for Regulatory Status column include: FE = federal endangered; FT = federally threatened; SE = state endangered; ST = state threatened.
*The Pueo is state listed as endangered only on the island of Oʻahu.
Legend: ROI = region of influence.
Source: Marine Corps, 2022; MCBH, 2023b; L. Bookless, personal communication, August 24, 2023.

Waterbirds

The Hawaiian Stilt or Aeʻo (*Himantopus mexicanus knudseni*) is an endangered wading shorebird that is common in the ROI. They use mudflats, shallow open water, flooded fields, coastal wetlands, and ephemeral bodies of water for nesting, loafing, and foraging. Hawaiian Stilts have been observed on MCBH Kaneohe Bay, including in the ROI, for decades. Behaviors such as loafing, foraging, and occasional nesting have been observed in the WRF. Nesting at WRF has the potential to occur from March–August with a peak in June–July (Department of Land and Natural Resources [DLNR], 2015).

Hawaiian Stilts have nested twice in the WRF sludge drying beds in the last 5 years. During the January and August Biannual State Waterbird Surveys, for the past 5 years the average number of Hawaiian Stilts counted at WRF at each seasonal survey event was nine (personal communication, L. Bookless, 2024). Outside of the WRF, Hawaiian Stilts have been routinely recorded foraging in nearby areas, including the entry driveway of the WRF. As many as 15 Hawaiian Stilts have been counted at one time foraging or loafing in the ROI (personal communication, L. Bookless, 2024).

The Hawaiian Gallinule or ʻAlae ʻula (*Gallinula galeata sandvicensis*) and Hawaiian Coot or ʻAlae keʻokeʻo (*Fulica alai*) are endangered waterbirds that regularly nest, loaf, and forage at MCBH Kaneohe Bay. These waterbirds utilize a variety of freshwater lowland habitats and can be somewhat secretive, although they can be observed swimming across open waters. These waterbirds utilize brackish and saltwater habitats and typically forage in shallow waters. The Hawaiian Coot and Hawaiian Gallinule are rarely observed within developed regions of the base and have not been observed in the ROI. The Hawaiian Duck is also not likely to occur at MCBH Kaneohe Bay. Since the Hawaiian Gallinule, Hawaiian Coot, and Hawaiian Duck are unlikely to be observed in the project area, only the Hawaiian Stilt is discussed further.

Pertinent to all waterbirds, avian botulism is a paralytic disease caused by ingestion of a toxin produced by a naturally occurring bacteria in the soil. Avian botulism outbreaks have occurred in the WRF from 2014 to 2016 and in 2020, with suspected cases occurring from 2017 to 2019. These outbreaks have resulted in deaths and illnesses of ducks, including the death of one Hawaiian Stilt (during the 2016 outbreak) in the WRF. During outbreak events, MCBH Kaneohe Bay Natural Resources staff promptly initiate collaborative efforts with U.S. Geological Survey and DLNR to reduce any effects to waterbirds. Monitoring for avian botulism-like symptoms is routinely conducted on MCBH Kaneohe Bay (MCBH, 2023b).

Seabirds

The endangered Hawaiian Petrel or ʻUaʻu *(Pterodroma sandwichensis*), threatened Newell's Shearwater or *ʻA*ʻo (*Puffinus newelli*), and endangered Hawaiian distinct population segment of Band-rumped Storm-petrel ʻAkē ʻakē (*Hydrobates castro*) have not been documented within the ROI. However, all three species have the potential to transit near or within the ROI (MCBH, 2023b).

Hawaiian Hoary Bat

The Hawaiian hoary bat or ʻōpeʻapeʻa (*Aeorestes semotus*) has been detected on a transitory basis at MCBH Kaneohe Bay but not at the WRF; no roosting sites or nests have been identified on base. Hawaiian hoary bats are a nocturnal solitary species, using echolocation to hunt for insects, typically from dusk until dawn, and roosting individually (rather than in a colony) during the day. They roost in native and non-native trees and forage along the edges of forest and within shrublands and open spaces, including pastures, roadways, forest gaps, and over areas of fresh/brackish water, as well as open saltwater (MCBH, 2023b). The bats prefer to roost and raise their young in trees that are greater than 15 feet tall. While the species is considered ubiquitous across the state, limited information and data is available regarding their ecology or population status. Surveys completed in 2021, including one site 0.35 miles southeast of the WRF and the Salvage Yard Wetland, detected bats during August through December, which overlaps with the reproductive season, but foraging activity was rarely observed (Pinzari et al., 2021). Despite low detection rates, the WRF may be used by foraging bats and some locations may harbor suitable roost habitat (Pinzari et al., 2021).

3.5.1.4 Special-status Species – State

There are no state special-status species plants in the ROI.

Hawaiian Short-eared Owl

The endemic land-dwelling Hawaiian Short-eared Owl or Pueo (*Asio flammeus*) is state-listed as endangered on O'ahu and found throughout the main Hawaiian Islands. Pueo occupy a variety of habitats but are most commonly observed utilizing open habitats like grasslands or shrublands for foraging and nesting efforts. Pueo are ground-nesting and tend to be more active during the day and crepuscular periods (dawn and dusk) (MCBH, 2023b). At least seven Pueo were estimated to utilize MCBH Kaneohe Bay during the 2020–2021 breeding season, and it is likely that the number of Pueo utilizing the area varies between seasons and from year to year (Price Lab, 2022). The study involved global positioning system-very high frequency, tagging of Pueo, recording observational behaviors such as transitioning within the WRF, and roosting/perching and nesting in areas of MCBH Kaneohe Bay (Price Lab, 2022). Pueo have been recorded (via global positioning system trackers) transitioning through the ROI.

White Tern

The White Tern or Manu-o-Kū (*Gygis alba*) is state-listed as threatened. White Terns have been observed on MCBH Kaneohe Bay and have the potential to occur within the airspace, tree canopy, or near the WRF. Breeding adults remain close to nest sites and forage at inshore areas such as shoals and banks with occasional forays into offshore waters. The nests are on tree branches, buildings or other man-made structures, rock ledges, or on the ground (DLNR, 2015). In Hawai'i, White Terns breed year-round, but most eggs are laid between February and June, with two peaks in egg-laying occurring in March and October (VanderWerf and Downs, 2018). White Terns have not been documented at or around the WRF.

3.5.2 Environmental Consequences

The environmental consequences section below describes the effects of the No-Action Alternative and Alternative 1 (construction and operations) to vegetation, wildlife, and special-status species in the ROI. A detailed analysis of ESA-listed species is in the BO for the MCBH Kaneohe WRF (Appendix D).

3.5.2.1 No-Action Alternative

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

3.5.2.2 Alternative 1

Construction

Vegetation

The construction of new infrastructure identified in Section 2.1.1 would result in the removal of over 70,000 square feet of landscaped area and vegetation along the perimeter fence line (see Table 2.1-1), as well as designated sections within the WRF. Minimal vegetation removal would occur for the communications duct bank trenching (8,000 square feet), which would occur in the softball field between the WRF and 3rd Street (see Figure 2.1-2). The proposed electric feeder cables outside the WRF would utilize an existing conduit and would not involve any ground disturbance. No notable ecological

communities occur in the proposed perimeter fence line area, the communications duct bank trenching, or other portions of the ROI. Site preparation and construction activities would involve the clearing of non-native trees and scrub along the perimeter and eastern edge of the WRF in mostly previously disturbed and landscaped areas, in addition to landscaped grass areas among the existing infrastructure. Within the proposed perimeter fence line of the WRF, roughly 17,000 square feet of landscaped grass and scrub at the entrance would be cleared and utilized as a trailer and vehicle parking area. In addition, two portions of landscaped grass to the west of the WRF would be utilized as contractor lay down areas and trailer and parking areas during construction. As referenced in the BMPs, landscape areas (20,000 square feet) containing native plants for restoration efforts for new or renovated facilities are located to the east of the WRF.

Vegetative restoration would include landscape and maintenance efforts in accordance with the MCBH Landscape Manual. The only plants permitted for landscaping use are identified on an approved list within the manual; non-approved landscaping plants would be reviewed and approved by MCBH Natural Resources staff (MCBH, 2023b). Therefore, Alternative 1 construction would have less than significant effects to vegetation.

Wildlife

Effects identified for birds generally apply to all species present. Unique effects specific to individual species or groups of birds are further detailed where applicable. The effect analysis below details the following "stressors" that can affect wildlife: habitat, water quality, strike, fallout/disorientation, and noise disturbance. Deterrents would be used during the construction period to discourage wildlife from occupying construction areas and to minimize potential negative effects to wildlife. Examples of a variety of physical, chemical, passive, and visual bird deterrents are discussed in Table 2.2-1.

Habitat

The entire perimeter of the WRF would be cleared of vegetation (over 70,000 square feet) in preparation for fence installment. The removal of non-native dominant trees effect Western Cattle-egrets and Black-crowned Night Herons that currently utilize the trees for loafing and roosting. The addition of parking spaces at the WRF would remove landscaped grassy areas which serve as foraging grounds, loafing areas, and potential nesting sites for waterbirds. Wildlife would be flushed from existing habitat, such as the clarifier and polishing pond, throughout the construction process. Effects to habitat would be moderate as existing species are mobile and similar habitat is adjacent to the WRF. When disturbances from construction activities occur, wildlife would be able to temporarily leave the immediate area of construction and relocate to the nearby Salvage Yard Wetland.

Water Quality

Standing water attracts avian wildlife, such as waterbirds and Western Cattle-egrets. Although ponding water is already present in the WRF, BMPs would be implemented to minimize potential effects to wildlife. This includes a biological monitor at WRF who would check the area for standing water and alert the contractor to remove water as quickly as possible (see Table 2.2-1). Construction activities would comply with MS4 permit requirements and the existing Storm Water Management Plan (MCBH, 2023a), thereby minimizing effects to water quality. In addition, BMPs such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins would further minimize effects. Such protocols would ensure that federal and state water quality standards remain in compliance and the waters of Kāneʻohe Bay and Salvage Yard Wetland are not affected.

Strike

A bird strike is a collision between an airborne animal and a moving vehicle, building, or infrastructure, such as power lines (MCBH, 2023b). Minimal risk of injury or death due to strike during construction is expected, as BMPs described above to prevent temporary ponding and excess lighting would minimize attraction of birds to the construction area thereby minimizing risk of strike.

Fallout/Disorientation

Seabird fallout can occur when unnatural lighting at night attracts and disorients birds to areas that may place them in dangerous conditions leading to their injury or death, as well as increased risk for potential bird aircraft strikes. Many bird species are attracted to facilities with lights, therefore lighting use during nighttime construction is a potential stressor to nocturnal or light-sensitive species. To minimize this potential effect, night work would be minimized during proposed construction (see Table 2.2-1). If lighting is required during construction, all exterior lights would meet or exceed MCBH, USFWS, NOAA, and/or International Dark-Sky Association standards for exterior lighting and the type of work to be undertaken (MCBH, 2022). Additional BMPs to further reduce risk of fallout include the elimination of lighting on the top of buildings and relocating lights close to the ground (see Table 2.2-1). In addition, all on-site contractors would be briefed on how to conduct construction in the presence of light-attracted bird species (L. Bookless, personal communication, March 6, 2022). Lighting in the WRF would have less than significant effects to seabirds due to MCBH Kaneohe Bay BMPs.

Noise Disturbance

Construction-related noise may temporarily displace wildlife from habitat in the immediate vicinity of the noise source in the ROI; however, the habitat in the ROI consists of mostly WRF-related infrastructure and landscaped area. Although the construction is expected to be implemented over a 3-year period, construction would occur in areas where existing machinery and equipment are in regular use. In these areas, wildlife has either adapted to the routine noise of the equipment or would temporarily relocate from construction areas to adjacent habitat, such as the neighboring Salvage Yard Wetland. To mitigate noise disturbances, sound barriers would be installed around generators during construction operations.

For the reasons listed above, Alternative 1 construction would have less than significant effects to wildlife.

Special-status Species

Special-status species in the ROI would be subject to a variety of physical disturbances during construction. A detailed analysis of ESA-listed species is in the Final BA (Appendix D).

Special-status Species – Federal

Waterbird

Proposed construction would potentially disturb Hawaiian Stilts by adding stressors related to standing water, trenching and holes, demolition, noise, lighting, and water quality. These effects would be minimized with BMPs and conservation measures described in Table 2.2-1. Specifically, effects associated with standing water would be reduced with measures for storm water management such as diversion features to enhance water flow to nearby wetlands, removing standing water once discovered, and incorporating storm water LID designs. To further reduce effects, open trenches and holes would be covered at the end of the workday. BMPs, such as prevention of standing water and use of a full-time

biological resources monitor, during construction would minimize the potential for effects to Hawaiian Stilts (see Table 2.2-1). A fence would be installed at the demolition site to prevent Hawaiian Stilt chicks accessing the WRF from the adjacent wetland, and waterbirds would be deterred using a combination of mitigations to make the area uninviting for nesting, foraging, or loafing birds. Vegetation at the WRF would be maintained at a height not to exceed 3 inches within all landscaped regions, and all vegetation would be removed from within sludge beds. In addition, a dust barrier would be installed and a variety of storm water management BMPs would be used to further reduce risks to Hawaiian Stilts. Construction would occur at previously developed and actively used areas where machinery is in regular use and occasionally create a noise environment consistent with a construction area, so birds have either adapted to the general noise construction areas or would temporarily relocate from the construction areas to adjacent similar habitats. To further reduce this disturbance, sound barriers around generators would be installed where possible, and nighttime work would be limited. If night work is required, BMPs such as ground-level fixtures, recessed lighting, shielding and long wave light sources would be used. In addition to BMPs, conservation measures described in Chapter 2 would further avoid and minimize adverse effects during construction. Therefore, Alternative 1 construction would have less than significant effects to waterbirds.

Seabirds

The effects from construction to the Hawaiian Petrel, Newell's Shearwater, and Hawaiian Band-rumped Storm-petrel from lighting and noise are as described above for general wildlife. Therefore, Alternative 1 construction would have less than significant effects to seabirds.

Hawaiian Hoary Bat

As discussed above, the construction activities in the WRF involve the removal of non-native dominated trees along the perimeter. While the Hawaiian hoary bat has the potential to forage or roost in the trees surrounding the WRF, no documentations of such behaviors have been recorded (Pinzari et al, 2021). The sporadically located trees are not suitable for Hawaiian hoary bat due to a lack of closed canopy which the bat seeks for protection from environmental factors. Tree trimming/removal activities are required to be done outside of hoary bat pupping season (June 1–September 15) (see BMPs in Table 2.2-1). Therefore, Alternative 1 construction would have less than significant effects to Hawaiian hoary bats.

Special-status Species – State

Hawaiian Short-eared Owl

Although Pueo have been recorded (via global positioning system trackers) transitioning through the ROI, presence of this species in the WRF during construction activities is unlikely. If adults, nests, or chicks are found and/or flushed out during construction activities, personnel would stop work and inform MCBH Natural Resources staff of the species' presence (Price Lab, 2022; MCBH, 2023b). The effects to Pueo from noise are as described above for general wildlife. Therefore, Alternative 1 construction would have less than significant effects to Pueo.

White Tern

White Terns have the potential to occur in the tree canopy or other areas in and around the WRF. Tree trimming activities would avoid the peak egg-laying/nesting months (March and October) and nest surveys would be conducted prior to tree removal, pruning, or trimming activities. If a tree scheduled for removal or trimming is found to contain a nest, the tree would not be disturbed until the chicks have fledged (approximately 48 days) (MCBH, 2023b). The effects to White Tern from noise are as described

above for general wildlife. Therefore, Alternative 1 construction would have less than significant effects to White Terns.

Operations

Vegetation

The operations of new infrastructure would result in additional infrastructure and treatment facilities in the WRF. Vegetation management in the WRF would continue to include maintenance of landscaped grass and ornamental plants. Vegetation management efforts would be in accordance with the MCBH Landscape Manual. The approved landscaped plants would include native vegetation, which require less water, fertilizer, and chemicals (MCBH, 2023b). Sustainable methods such as water conservation, erosion control, filtration of non-point source pollution from storm water runoff, and noise absorption would improve ecosystem functions. Regular vegetation clearing would continue to be in accordance with MCBH Landscape Manual. No trees would be disturbed along the western fence adjacent to the Salvage Yard Wetland. Therefore, Alternative 1 operations would have less than significant effects to vegetation.

Wildlife

The effect analysis below details the following "stressors" that can affect wildlife: habitat, water quality, strike, fallout/disorientation, and noise disturbance. Deterrents as described in Table 2.2-1 would be used during operational activities to discourage wildlife from occupying operational areas and to minimize potential negative effects to wildlife.

Habitat

The entire perimeter of the WRF would be regularly cleared of vegetation from the fence line area, with the exception of the western fence. With the reduction of trees within and along the perimeter of the WRF, the area is less attractive for Western Cattle-egret to roost and loaf in the ROI. Until the existing sludge beds are no longer needed and are removed, they would be kept free of vegetation to discourage nesting. The additional parking spaces could create more consistent flushing of wildlife from foraging in the landscaped grass. Additionally, vegetation would be maintained to reduce the attraction of birds to the area for nesting purposes. Deterrents would also flush out wildlife from the polishing pond and clarifiers, which are used by wildlife for resting, loafing, and foraging grounds. Existing species are mobile, and similar habitat is adjacent to the WRF. When disturbances from operational activities occur, wildlife would relocate to the nearby Salvage Yard Wetland.

Water Quality

Standing water attracts avian wildlife such as waterbirds and Western Cattle-egrets. Although ponding water is already present in the WRF, BMPs would be implemented to minimize standing water, to include the presence of a biological monitor to ensure prompt removal of any standing water (see Table 2.2-1). Operational activities would comply with MS4 permit requirements and the existing Storm Water Management Plan, thereby minimizing effects to water quality (MCBH, 2023a). In addition, BMPs such as the use of bioretention techniques, vegetated swales and filter strips, and retention basins would further minimize effects.

Fallout/Disorientation

Lighting during nighttime operations is a potential stressor to nocturnal or light-sensitive species. To minimize this potential effect, MCBH incorporates wildlife-friendly lighting (see Table 2.2-1). Lights would meet or exceed MCBH, USFWS, NOAA, and/or International Dark-Sky Association standards for exterior lighting and the type of work to be undertaken. Additional BMPs to further reduce risk of fallout (see Table 2.2-1) include the elimination of lighting on the top of buildings and relocating lights close to the ground.

Strike

Minimal risk of injury or death due to vehicle or equipment collisions during operations is expected. BMPs described above to prevent temporary ponding and excess lighting would minimize attraction of birds to the operational areas thereby minimizing risk of strike.

Noise Disturbance

Operational noise may temporarily displace wildlife from habitat in the immediate vicinity of the noise source in the ROI; however, the habitat in the ROI consists mostly of WRF-related infrastructure and previously disturbed areas. Wildlife in the ROI are acclimated to existing operational noise at the WRF. Noise from equipment would be the same as existing operational noise and, thus, there would be no change to operational noise.

For the reasons listed above, Alternative 1 operations would have less than significant effects to wildlife.

Special-status Species

A summary analysis for each special-status species is presented below for effects associated with the facilities operation at the WRF.

Special-status Species – Federal

Waterbird

Proposed operations could result in stressors related to standing water, noise, lighting, water quality, and operation of the sludge drying beds and secondary clarifier. The sludge drying beds and secondary clarifier presently attract Hawaiian Stilts. To reduce their attractiveness to Hawaiian Stilts, the sludge beds would be kept free of vegetation (see Table 2.2-1). Should Hawaiian Stilts nest in the drying beds, the biological monitor shall implement an appropriate stand-off distance to avoid disturbing the nesting birds, and the sludge beds would not be used until the chicks have hatched, fledged, and left the area. To reduce stilt activity at the clarifier, deterrents such as netting, predator decoys, and noises would be used. In addition, BMPs include use of a full-time biological resources monitor (see Table 2.2-1). If night work is required, BMPs such as ground-level fixtures, recessed lighting, shielding and long wave light sources would be used. In addition to BMPs, conservation measures described in Chapter 2 would further avoid and minimize operational adverse effects. Therefore, Alternative 1 operations would have less than significant effects to waterbirds.

Seabirds

The effects from operations to the Hawaiian Petrel, Newell's Shearwater, and Hawaiian Band-rumped Storm-petrel from lighting and noise are as described above for wildlife. Therefore, Alternative 1 operations would have less than significant effects to seabirds.

Hawaiian Hoary Bat

Any operational tree trimming/removal would be required to occur outside of Hawaiian hoary bat pupping season (June 1–September 15) to reduce risk of injury, death, or disturbance to Hawaiian hoary bats as discussed in Table 2.2-1. The main stressor for Hawaiian hoary bat would be barbed wire placed on top of the compound fence. The compound is enclosed with chain-link fence and has been for decades. The fence does not currently have barbed wire; however, it would be installed on the fence as part of the WRF expansion project. Approximately 2,100 linear feet of security fencing would include three strands of barbed wire fencing, totaling approximately 6,300 linear feet. Based on the USFWS formula to determine potential bat take, the barbed wire fence would not result in a take during the life of the fence. The effects to Hawaiian hoary bat from lighting and noise are as described above for wildlife. Therefore, Alternative 1 operations would have less than significant effects to Hawaiian hoary bats.

Special-status Species – State

Hawaiian Short-eared Owl

If adult Pueo, nests, or chicks are found and/or flushed out during operational activities, personnel would stop work and inform MCBH Kaneohe Bay Natural Resources staff of the species' presence (Price Lab, 2022). The effects to Pueo from noise are as described above for general wildlife. Therefore, Alternative 1 operations would have less than significant effects to Pueo.

White Tern

Any routine tree trimming activities would avoid the peak egg-laying/nesting months (March and October) and nest surveys would be conducted prior to tree removal, pruning, or trimming activities. If a tree scheduled for removal or trimming is found to contain a White Tern nest, the tree would not be disturbed until the chicks have fledged (approximately 48 days) (MCBH, 2023b). The effects to White Tern from noise are as described above for general wildlife. Therefore, Alternative 1 operations would have less than significant effects to White Terns.

ESA Section 7 Consultation

Pursuant to Section 7(a)(2) of the ESA, the Marine Corps conducted informal and formal consultation with USFWS regarding potential effects to ESA-listed species (Appendix D). Formal consultation was for Hawaiian Stilt; species included in the informal consultation were Hawaiian hoary bat, Hawaiian Petrel, Newell's Townsend's Shearwater, and Band-rumped Storm Petrel. For the Hawaiian Stilt, the BA identified current pre-construction daily operational effects, as well as construction effects and future post-construction operational effects from the proposed action. For the proposed action, the BA found the stilts could be harassed or accidently injured or killed from the movement of equipment within the project site and laydown yards, standing water, trenching, demolition, noise and, if nighttime work occurs, lighting. Regarding current pre-construction and future operation of the WRF, in addition to effects from standing water, noise and lighting, operation of the sludge drying beds and the current secondary clarifier could also result in harm to the stilts as a result of their nesting and feeding in these

areas. Consequently, the BA concluded that construction and operation of the WRF could result in stressors related to standing water, trenching and holes, demolition, noise, lighting, water quality, sludge drying beds, and the secondary clarifier. The proposed action would disturb stilts and would require deterrence and hazing efforts during construction and operation of the WRF to prevent injury or death to stilts, and thus "will affect" the Hawaiian Stilt.

In March 2025, the USFWS issued its BO, which noted the existing operation of the WRF had resulted in the deaths of adult stilts. The document identified "likely effects to the [stilts] include effects associated with: 1) disturbance from activities occurring near forests found within the action area; 2) hazing ...; and 3) drain cover removal at the primary and secondary clarifiers" resulting from construction and operation of the WRF. The BO concluded that "conservation measures are anticipated to avoid and minimize many of the probable adverse effects ... [and] it is the Service's biological opinion that the WRF upgrade, as proposed, is not likely to jeopardize the continued existence of the [stilt]." A corresponding ITS authorizes the take of eggs and chicks associated with up to 2 nests every five years. Reauthorization is required for a number of reasons to include "if the amount or extent of taking specified in the [ITS] is exceeded."

3.6 Utilities

The term "utilities" refers to infrastructure supplying MCBH Kaneohe Bay with electrical power, potable water, wastewater, storm water, solid waste, and information technology/communications. This section describes the existing conditions of utilities and discusses potential effects to utility capacity and services that could result from implementation of Alternative 1.

3.6.1 Affected Environment

This section describes the existing conditions for utilities and associated infrastructure. The ROI for utilities includes areas at and immediately surrounding the WRF. Utilities include the existing WRF (west of the main WRF entry gate and southeast of the marina), existing support facilities (to the north), power substation facilities and the main gate (to the east), locations of construction staging areas, and locations of the proposed support facilities. Table 3.6-1 describes the existing conditions of each utility system. There are currently no utilities deficiencies identified for operating the existing WRF.

Table 3.6-1 Existing Conditions for Utilities at MCBH Kaneohe Bay

Utility	*Existing Conditions*
Electrical Power	• Hawaiian Electric Company services and maintains MCBH electrical power and associated infrastructure. • The electrical power system includes overhead transmission lines, substations, and distribution lines. • Electrical tie-ins are present at the existing WRF. • MCBH is currently undertaking two electrical system modernization projects. Phase 1 is currently underway and will be completed by 2026, and Phase 2 will commence in 2026 and be completed by 2030. The projects will involve the repair and update of components of the electrical distribution system on base, including substations, switch stations, and electronic controls and sensors servicing the WRF. • MCBH generates 5 MW of solar energy on base, with initiatives to support an additional 1.5 MW of solar generation. • Generators for the existing and new plants are used for backup power.
Potable Water	• The City and County of Honolulu Board of Water Supply provides potable water. • Groundwater sources supplying water to the MCBH system include the Kaluanui Wells, Ma'akua Well, Punalu'u Wells II, and Waihe'e Tunnel. • MCBH Kaneohe Bay owns and maintains a potable water distribution system that delivers water to tenants throughout the base. • The State of Hawai'i approves the use of recycled wastewater for landscape irrigation. Potable water is used for irrigation; the existing effluent chlorination system is currently inactive, so recycled water is no longer being used at Klipper Golf Course for irrigation.

Utility	*Existing Conditions*
Wastewater	• The WRF is the only means for treating wastewater at MCBH Kaneohe Bay and is designed to accommodate an average daily flow of 2 mgd. • Treated effluent is pumped to the Kailua Regional Wastewater Treatment Plant outfall for ocean disposal using the existing effluent pump system (i.e., Effluent Outfall 001). This is done in accordance with the NPDES wastewater permit. • The existing effluent chlorination system is currently inactive. • MCBH Kaneohe Bay has a separate sanitary sewer system. In this system, one set of pipes collects wastewater from tenants to deliver to the WRF for treatment.
Storm Water	• On-base storm water is directed to the MS4 through separate pipes. Typically, the WRF does not treat storm water; however, during heavy rain events, the volume of water treated at WRF increases due to infiltration and inflow issues within the sanitary sewer collection system.
Solid Waste	• MCBH Kaneohe Bay maintains the MCBH Recycling and Waste Management Center, and one of three permitted solid waste landfills on Oʻahu. These facilities serve MCBH Kaneohe Bay tenants. All treated wastewater sludge from the WRF is taken to the solid waste landfill on base. • Green waste from on-base units and tenants is accepted at the MCBH Kaneohe Bay landfill; other green waste is disposed of off base. The private landfill in Waiʻanae is the only permitted C&D debris landfill on Oʻahu. All construction waste generated at MCBH Kaneohe Bay is disposed of at the private landfill. • The private landfill accepts up to 3,000 tons of C&D waste per day, of which approximately 80 percent is reused or recycled using their sorting facility).
Information Technology/Communications	• MCBH Kaneohe Bay S-6 provides secure telecommunications to the installation in support of 21st-century voice, data, and video requirements. • MCBH Kaneohe Bay S-6 IT/COMM infrastructure currently services the existing WRF. • The IT/COMM systems typically consist of cables within buried conduit, encased in concrete, and running between manholes/handholes.

Legend: C&D = construction and demolition; IT/COMM = information technology/communications; MCBH = Marine Corps Base Hawaii; mgd = million gallons per day; MS4 = Municipal Separate Storm Sewer System; MW = megawatt; NPDES = National Pollutant Discharge Elimination System; Ltd.; WRF = Water Reclamation Facility.

3.6.2 Environmental Consequences

The effect analysis for utilities compares the existing capacity and demand on a utility to the projected capacity and demand needed for construction and operation of the upgraded WRF under Alternative 1. The effects analysis evaluates the potential for effects to utility infrastructure.

3.6.2.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur. This would result in an increased potential for discharges to occur that do not meet water quality standards and permit requirements for operation of the existing WRF. As a result, the No-Action Alternative would potentially adversely affect utilities.

3.6.2.2 Alternative 1

Table 3.6-2 describes the effects to each utility as a result of Alternative 1. The proposed action would result in an increase of five personnel, which would not have a notable change to utilities demand at the installation. All utility systems have adequate capacity to support the proposed action. In addition, the upgraded WRF would provide the capability to reuse treated wastewater, thereby reducing overall potable water demand at the base. No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course. The R-1 recycled water would be used for irrigation at the Klipper Golf Course, thus, reducing overall water demand from the City and County of Honolulu Board of Water Supply. Any treated water not meeting R-1 quality would not be reused at the golf course; it would be managed using current processes. Irrigation of the Klipper Golf Course with R-1 quality recycled water would reduce the amount of treated wastewater being discharged through the municipal outfall. For these reasons, Alternative 1 construction and operations would have beneficial but less than significant effects to utilities.

Table 3.6-2 Summary of Effects to Utilities

Utility	*Construction*	*Operation*
Electrical Power	• Existing users may experience short-term electrical power outages during construction activities as the WRF is brought online. • Potential outages would be brief and occur during daylight hours. • BMPs, such as providing advance notice of expected outages to customers, would be implemented to minimize the effects of these disruptions. • Generators for construction would be used for backup power. Potential electrical power disruptions from construction would have minimal effects to the current system and customers. • All electrical power systems have adequate capacity to support the proposed action.	Generators for the upgraded WRF would be used for backup power. Alternative 1 would have beneficial effects to electrical power through electrical utility upgrades, consolidation of buildings/structures, and incorporation of energy-efficient design to reduce the overall electrical usage of the WRF. All electrical power systems have adequate capacity to support the proposed action.
Potable Water	• Water use during construction and operations of the WRF would not exceed the system capacity or result in any disruption of service for existing users. • No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course. • All potable water systems have adequate capacity to support the proposed action.	Alternative 1 would have beneficial effects to potable water use at MCBH Kaneohe Bay as a result of reduced water use of the upgraded WRF and with reuse of R-1 recycled water for irrigation purposes. In addition, the R-1 system would allow use of in-plant water for WRF operations and maintenance (e.g., lubrication, wash downs), which would reduce potable water use at the facility. All potable water systems have adequate capacity to support the proposed action.

Utility	*Construction*	*Operation*
Wastewater	• During construction of the upgraded WRF, the WRF would remain operational and continue to treat MCBH wastewater in a manner consistent with the NPDES wastewater permit effluent requirements. • Portable toilets would be provided for the construction workforce. The toilets would be routinely emptied, and the sewage would be treated at the WRF. • All wastewater systems have adequate capacity to support the proposed action.	Alternative 1 would have beneficial effects to wastewater because of: • Improved water treatment from secondary to tertiary treatment, allowing disinfection for 100 percent of the effluent treated by the system and thereby improving the quality of the treated water. • Increased capacity and efficiency of the WRF to accommodate higher peak flows and store and treat up to 10 mgd during heavy rain events. • Improvement of treated wastewater to achieve R-1 level water (the highest grade of recycled water). • Ability to reuse R-1 level water at the Klipper Golf Course, reducing the overall water demand from the City and County of Honolulu Board of Water Supply at MCBH Kaneohe Bay. • Resolution of issues related to the single-train treatment process by providing redundancy in the system that allows for effective operations while components are offline for repair or maintenance, increasing the efficiency of the system. • No changes or modifications to the ocean outfall or its use would occur, and the treated effluent would continue to be discharged to the ocean outfall in the same manner as is currently done. • All wastewater systems have adequate capacity to support the proposed action.
Storm Water	• Construction BMPs, including compliance with the requirements of the MS4 permit, applicable SWPPP, use of storm drain filter socks, and use of LID techniques to avoid, prevent, and/or contain contamination of water resources, would minimize effects to storm water. • All storm water systems have adequate capacity to support the proposed action.	• Upgraded storm water conveyance and management systems would accommodate increases in storm water due to an increase in impervious surfaces from the paving of roads and walkways. • Upgraded water and sewer utilities, gravity and pressure pipelines, and WRF would facilitate compliance with the MS4 permit. No modifications or changes in ocean outfall use would occur. Alternative 1 would include installation of LID features that would reduce storm water discharge on base. Therefore, with the implementation of BMPs in Table 2.2-1, Alternative 1 would have beneficial effects to storm water. • All storm water systems have adequate capacity to support the proposed action.

Utility	*Construction*	*Operation*
Solid Waste	• Alternative 1 construction would generate solid waste typical of standard construction projects, such as building materials and plumbing or electrical materials. Solid waste would be managed consistent with the MCBH Recycling and Waste Management Center Recycling and Waste Guide. This would address locations where solid waste containers would be provided during construction and procedures for waste collection, handling, and off-base disposal. Construction and demolition materials would be disposed of at the PVT Landfill in Waianae and would not affect capacity or services at the MCBH landfill. Green waste and other materials that can be diverted from the landfill would be managed separately and would be disposed of off base. With the implementation of these measures, effects would be negligible. • A solid waste management plan would be prepared for construction addressing the waste disposed and recycled. • All solid waste systems have adequate capacity to support the proposed action.	Alternative 1 operations would result in a negligible increase in solid waste generated by the WRF and support facilities. All treated wastewater sludge from the WRF would continue to be taken to the solid waste landfill on base. The existing solid waste management system has sufficient capacity to accommodate operations of Alternative 1. Therefore, Alternative 1 would have less than significant effects to solid waste. All solid waste systems have adequate capacity to support the proposed action.
IT/COMM	• Alternative 1 construction could result in a one-time, short-duration outage as a result of installation of new IT/COMM infrastructure and tie-in of new service. BMPs such as providing advance notice of expected outages to customers would be implemented to minimize the effects of these disruptions. • All IT/COMM systems have adequate capacity to support the proposed action.	Alternative 1 operations would not have effects to IT/COMM. The existing IT/COMM has sufficient capacity to accommodate the requirements of Alternative 1. Therefore, Alternative 1 operations would have less than significant effects to IT/COMM. All IT/COMM systems have adequate capacity to support the proposed action.

Legend: BMP = best management practice; IT/COMM = information technology/communications; LID = Low Impact Development; MCBH = Marine Corps Base Hawaii; mgd = million gallons per day; MS4 = Municipal Separate Storm Sewer System; NPDES = National Pollutant Discharge Elimination System; PVT = PVT Land Company, Ltd.; SWPPP = Storm Water Pollution Prevention Plan; WRF = Water Reclamation Facility

3.7 Transportation

The discussion of transportation involves effects to off-base and on-base roadways, bus routes, bikeways, pedestrian facilities, and the two access gates into MCBH Kaneohe Bay.

3.7.1 Affected Environment

Figure 3.7-1 shows the transportation ROI, which is the network immediately outside of MCBH Kaneohe Bay, the road system internal to the installation, the two access gates, and public transit elements in the vicinity. The road system consists of interstates, state roads, county roads, and roads internal to the installation managed by MCBH Kaneohe Bay.

3.7.1.1 Roadway Characteristics

External Roadways

Vehicle traffic into MCBH Kaneohe Bay is achieved by using the H-3 interstate federal highway, which connects from the H-1 in Aiea and runs east to MCBH Kaneohe Bay Main Gate. Other state and county roads provide access routes to the base. These roadways and roadway characteristics are listed in Table 3.7-1.

Table 3.7-1 External Roadway Characteristics

Roadway	*Description*	*Road Type (HDOT, 2024a)*	*Number of Lanes*	*2022 AADT (HDOT, 2024b)*	*Peak Hour Traffic*
H-3 (Between MP 14.86 and 15.316)	From Halawa, around Kāneʻohe, and to MCBH Kaneohe Bay Main Gate	Interstate	Four–six (two–three in each direction)	14,386	Not available
Mokapu Road (Route 6015 between MP 0 and 0.598)	From Intersection of Kaneohe Bay Drive north to MCBH Kaneohe Bay Mōkapu Gate (Back Gate)	Major collector	Four (two in each direction)	9,500	Not available
Mokapu Blvd. (Route 65 between MP 3.29 and 4.148)	From the intersection of Oneawa Street north to Mokapu Road	Principal arterial	Four (two in each direction)	9,900	Not available
Kaneohe Bay Drive (Route 6511 Between MP 0 and 2.587)	From Mokapu Saddle Road north the MCBH Kaneohe Bay	Major collector	Two (one in each direction)	9,700	Not available

Roadway	*Description*	*Road Type (HDOT, 2024a)*	*Number of Lanes*	*2022 AADT (HDOT, 2024b)*	*Peak Hour Traffic*
North Kalaheo Ave. (Route 6012 Between MP 0 and 2.114)	From Kailua Road north to Mokapu Road	Major collector	Two (one in each direction)	12,700	Not available

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

Legend: AADT = annual average daily traffic; HDOT = Hawai'i Department of Transportation; MP = mile post; MCBH = Marine Corps Base Hawaii.

On-Base Roadways

Roadways that are in the immediate area of the ROI and are potential construction delivery haul routes include use of G Street and 3rd Street. The on-base roadways and roadway characteristics are listed in Table 3.7-2.

Table 3.7-2 On-Base Roadway Characteristics

Roadway	*Description*	*# of Lanes*	*2022 AADT*	*Peak Hour Traffic*
G Street	Main road from Main Gate; principal arterial	Four (two in each direction)	TBP	Not available
3rd Street	Principal arterial	Two (one in each direction)	TBP	Not available
1st Street	Arterial	Two (one in each direction)	TBP	Not available
Mokapu Road	Principal arterial	Four (two in each direction)	TBP	Not available

Legend: AADT = annual average daily traffic; TBP = to be provided.

3.7.1.2 Bus Routes

Honolulu County public bus routes connect throughout the island of O'ahu (City and County of Honolulu, 2023a). There are no county bus stops on MCBH Kaneohe Bay (City and County of Honolulu, 2023b). The bus routes closest to MCBH Kaneohe Bay are Route 61, which runs east to west along Kaneohe Bay Drive, and Route 66, which runs north to south between Kailua and the Base. Routes 85 and 87 run from downtown Honolulu. Bus route PH4 starts from Pearl Habor into Kāne'ohe to Kailua. The distance from the nearest bus stop to the main gate is approximately 0.8 mile. The distance from the nearest bus stop to the Mōkapu Gate is approximately 1 mile.

Figure 3.7-1 Roadways near MCBH Kaneohe Bay

3.7.1.3 Bike Ways and Pedestrian Facilities

The existing bikeway network includes a variety of shared use paths, bike lanes, and bike routes shared with roadways throughout Kāneʻohe, Kailua, and the MCBH Kaneohe Bay (City and County of Honolulu, 2019). A shared bikeway and pedestrian use path along the east side of H-3 between Kaneohe Bay Drive and MCBH Kaneohe Bay Main Gate can be used from the nearest bus stop. Another bike route along a shared roadway is from Kaneohe Bay Drive between Mokapu Road and H-3. These bikeways connect other bikeways within the Kailua community. Pedestrian facilities on-base and off-base include sidewalks and crosswalks.

3.7.2 Environmental Consequences

3.7.2.1 No-Action Alternative

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

3.7.2.2 Alternative 1

Construction

Under Alternative 1, construction traffic would occur on the segment of the H-3 freeway between the Mōkapu Interchange and the MCBH Kaneohe Bay Main Gate. Construction traffic would be required to enter and exit the installation through the main gate. The Marine Corps estimated construction traffic using a recent comparable construction project (Mōkapu Elementary School improvements) would be approximately 68 additional vehicle trips per day entering and exiting the installation at the main gate in the morning and afternoon peak periods, representing a 7% increase over normal conditions if all traffic were to occur in the same hour (MCBH, 2021b). While such an increase could cause minor delays in entering the base, it is similar to fluctuations that occur with other construction projects at MCBH Kaneohe Bay and are accommodated without affecting H-3 traffic (MCBH, 2021b). The entrance to the main gate is at the end of the H-3 and approximately 0.5 mile from the last H-3 exit. Construction traffic would be considerably less than 1 percent of average daily traffic volume on H-3 and have less than significant effects to H-3 traffic, which averages 13,400 trips per day. As such, only traffic entering MCBH Kaneohe Bay would be minimally affected by the proposed action and would not change the Level of Service of H-3 off base during peak or non-peak hours. Construction vehicles and equipment would be limited to entering the installation through the main gate, so project construction would not affect the off-base neighborhood near Mōkapu Gate. A Hawaiʻi Department of Transportation (HDOT) permit would be required to transport oversized equipment and overweight vehicles on state roadways, such as the H-3.

For these reasons, Alternative 1 construction would have less than significant effects to transportation.

Operations

Operations would see an increase of five personnel. Additional personnel are anticipated to live off base in levels consistent with existing conditions; as such, no effects to off-base road networks are anticipated. As a result, the change in traffic for personnel commuting or driving in the community would not change the Level of Service of H-3 average daily traffic volumes. In addition, this would not represent a substantial change from personnel working on base, and the amount and type of operational vehicle traffic (e.g., deliveries and maintenance vehicles) would not change from current operations at the WRF. For these reasons, Alternative 1 operations would have less than significant effects to transportation.

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4 Cumulative Effects

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

4.1 Definition of Cumulative Effects

Cumulative effects are defined in 40 C.F.R. 1508.1(g) as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."

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

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

4.2 Scope of Cumulative Effects Analysis

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

4.3 Past, Present, and Reasonably Foreseeable Actions

Actions included in the cumulative effects analysis for MCBH Kaneohe Bay are shown in Table 4.3-1.

Table 4.3-1 Past, Present, and Reasonably Foreseeable Future Actions

Index Number	*Action*	*Year*	*Description*
MCBH Kaneohe Bay			
1	Regimental Consolidated Communications/ Electrical Facility	2018–2022	• Consolidation of facilities (20,423 square feet) in over seven facilities around the base.
2	Mōkapu Gate Entry Control AT/FP Compliance	2018–2022	• Includes demolition; Building 1188 is 2,800 square feet.
3	District CHW and DHW Plant for Buildings 7046, 6047, and 7057-7059	2020	• Centralize water production to eliminate redundant chiller. New facility for the chiller pad, along with water lines (900 square feet).
4	Corrosion Control Hangar	2019–2023	• Support paint stripping activities for tiltrotor and rotary-wing aircraft (31,904 square feet).
5	Bachelor Enlisted Quarters (Aviation Support)	2020	• Demolition: Walkways 1003, 1004, and 1005; Buildings 227, 228, 3000 and cooling plant (341,001 square feet).
6	Waikulu Family Housing	2018	• Redeveloped into 375 three- and four-bedroom duplexes and multiplexes.
7	Hana Like Family Housing	2018	• Redeveloped into 182 three- and four-bedroom duplexes and multiplexes.
8	Mōkapu Elementary School Campus Improvements	2023	• Redevelopment of existing school campus for classrooms, administration, library, and cafeteria facilities, along with a covered play court, playfield, and surface parking lots (162,000 square feet).
9	Helicopter Squadrons Deactivation	2021–2022	• AH-1/UH-1 squadron and the CH-53E squadron were deactivated, and the RQ-21 squadron was divested from the VMU squadron. This resulted in a decrease of approximately 841 personnel plus family members.
10	Airfield Guard Houses	2025	• Relocate Guard Houses along Mōkapu Road.
11	Dog Kennel	2024	• Construct a new dog kennel facility.
12	Rappel Tower and Gas Chamber	2021	• Demolition: Building 6042. Reconstruct in place, total of 3,700 feet (larger than Building 6042).
13	Bachelor Enlisted Quarters	2022–2026	• Construct 180-person quarters, Buildings 1655 and 1656 (48,470 square feet).
14	Phase 1 Electrical Distribution Modernization, Base-wide	2022–2026	• 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).
15	Bachelor Enlisted Quarters	2024–2028	• 200-person quarters. Demolition: Building 386, 1634, and 1635 (47,620 square feet).
16	H-3 Main Gate Entry Control AT/FP Compliance	2025–2028	• Demolition: Buildings 1636 and 1637. Reconstruct in place.

Index Number	*Action*	*Year*	*Description*
17	Maintenance Facility	2029	• New consolidated maintenance facility and warehouse storage, and replacement van pads. Demolition: Van Pads C and D (53,733 square feet).
18	Phase 2 Electrical Distribution Modernization	2026–2030	• Repair and upgrade various components of the electrical distribution system and upgrade substation 1125. Demolition: Building 1274.
19	Home Basing of the MQ-9 Marine Unmanned Aerial Vehicle Squadron and KC-130J Marine Aerial Refueler Transport Squadron	2023–2028	• Home base a Marine Corps MQ-9 Marine Unmanned Aerial Vehicle Squadron and a KC-130J Aerial Refueler Transport Squadron at MCBH Kaneohe Bay. • Conduct approximately 8,280 annual aircraft operations. • Station approximately 676 personnel plus dependents at MCBH Kaneohe Bay.
20	New Aircraft Hangar and Apron	2025	• Replace Hangar 103 and construct a new parking apron.
21	KC-130J Wash Rack	2026	• Construct a new wash rack for KC-130Js.
22	Flightline Security Fencing	2026	• Repair existing flightline fencing. • Construct new flightline fencing. • Construct two new parking structures on 1st Street.
23	Air Traffic Control Company M Compound	2028	• Facility for Air Traffic Control Company M with Company Headquarters, Operations Building, Operations Vehicle Laydown, Vehicle Maintenance Building, Van Pads, Communications Shop, and storage.
24	Alternate Communications Feeder	2030–2034	• New communications ductbank.
25	C-40 Aircraft Maintenance Hangar and Parking Apron	2025–2027	• Construct and operate a modified Type III aircraft hangar at MCBH Kaneohe Bay with an aircraft apron and other supporting infrastructure modifications to support C-40A aircraft maintenance and operations. • Demolish existing Hangar 104 and existing site elements.
26	MCBH Ground Forces Modernization Construction Projects	8-year period from Fiscal Year (FY) 2024 through FY 2031	• 3d Marine Littoral Regiment Armory Expansion • 1st Low-Altitude Air Defense Headquarters & Service Battery Compound • Navy/Marine Corps Expeditionary Ship Interdiction System Facility • Consolidated Secure Communications Facility • 3d Littoral Anti-Air Battalion Air Control Battery Compound • Live-Virtual Constructive Training Environment Complex • Consolidated Paraloft and Dive Shop and 3d Radio Battalion Boat Shop • Ground/Air Task-Oriented Radar Climate Controlled Warehouse and Pad

Index Number	*Action*	*Year*	*Description*
27	MCBH Ground Forces Modernization Training	FY 2024	• Training with updated ground forces equipment at multiple existing training locations at MCBH Kaneohe Bay.
28	Electrical System Modernization	Phase 1: present-2026 Phase 2: 2026-2030	• The projects involve the repair and update of components of the electrical distribution system on base, including substations, switch stations, and electronic controls and sensors servicing the WRF.
29	Kailua Regional Wastewater Treatment Plant Upgrades	Ongoing–2030	• Upgrades to facilities and treatment processes to improve effluent water quality discharges. This includes upgrade of one of two bio towers and reinstalling an ultraviolet disinfection process.

Legend: AT/FP = Anti-terrorism Force Protection; CHW = Chilled Water; DHW = Domestic Hot Water; MCBH = Marine Corps Base Hawaii; SCADA = Supervisory Control and Data Acquisition; VMU = Marine Unmanned Aerial Vehicle Squadron.
Source: MCBH, 2024d.

4.4 Cumulative Effect Analysis

Noise. The past, present, and future actions at MCBH Kaneohe Bay would include the use of construction equipment that would result in increased temporary intermittent noise levels within the affected environment. The timing of some future projects in Table 4.3-1 may overlap temporally and geographically with the construction period of the proposed action (scheduled to occur over a 3-year period) and operation of the upgraded WRF. However, noise level increases would be temporary and typical of standard construction activities as identified in the noise resource section. While individual construction activities would temporarily increase noise levels in the construction area, the varied scale, location, timing of future construction, and the relatively short duration of the proposed action noise effects would have less than significant cumulative effects. Operations of the upgraded WRF would result in noise identical to current operations. For these reasons, the proposed action, when added to noise emissions from past, present, and reasonably foreseeable future actions, would have less than significant noise effects.

Air Quality. The projects listed in Table 4.3-1 using construction equipment would result in increased temporary air emissions of both criteria pollutants and GHGs in the affected environment similar to those described for construction in the air quality resource section. Future projects may overlap temporally and geographically with the construction period of the proposed action and operation of the upgraded WRF; however, the area is in attainment of the NAAQS for all criteria pollutants, and the incremental increase to air emissions identified for the proposed action would be well below threshold limits even when considered along with the projects in Table 4.3-1 (see Section 3.2, *Air Quality*). For these reasons, the proposed action, when added to emissions from past, present and reasonably foreseeable future actions, would have less than significant effects to air quality.

GHG Emissions. Construction emissions are estimated to occur over a 3-year period. Implementation of the proposed action would contribute to emissions of GHGs from the combustion of fossil fuels. Regarding GHGs, this analysis estimates the total GHG emissions, in terms of CO_2e exclusively generated within the State of Hawai‘i as a result of the 3-year construction activities, to be approximately 200.2 tons (181.6 metric tons) per year. Construction activities associated with the proposed action would increase GHG emissions compared to the No-Action Alternative. Based on the statewide GHG projection of 19.93 million metric tons of GHGs for 2025 (DOH, 2024), the estimated annual average GHG increase

over the 3-year construction period would be less than 0.0009 percent of the 2025 GHG projection. Such a temporary and small annual increase over the 2025 projection level would be negligible. Therefore, Alternative 1 construction would have less than significant effects to GHGs, resulting in no meaningful effects to natural hazards in the future with respect to the GHG concentration level in the atmosphere. Implementation of the proposed action during operation would not result in changes to GHG emissions compared to the baseline condition. Therefore, Alternative 1 construction and operations would have less than significant effects to GHG emissions and subsequent effects to natural hazards.

Water Resources. The projects listed in Table 4.3-1 would have less than significant effects to water resources. All projects at MCBH Kaneohe Bay would be constructed in accordance with MS4 permit regulations, incorporate LID features to limit the increase in storm water runoff, and incorporate standard BMPs such as those in the Storm Water Management Plan (MCBH, 2023a). The proposed action includes only a minimal increase in personnel and thus would not contribute to any change in water usage. The proposed Kailua Regional Wastewater Treatment Plant upgrades listed in Table 4-1 along with the proposed action would improve water quality of the effluent being discharged into Kailua Bay. For these reasons, the proposed action, when added to past, present and reasonably foreseeable future actions, would have less than significant effects to water resources.

Cultural Resources. Past, present, and reasonably foreseeable future projects in Table 4.3-1 could adversely affect cultural resources within the Mōkapu House Lots Archaeological District at Pali Kilo, the Naval Air Station Kaneohe Bay Administration District, and the Waimānalo Archaeological District. All the projects with a federal nexus have been or would be reviewed under NHPA Section 106 to determine effects to historic properties, and subsequently any adverse effects would be avoided, minimized, or mitigated pursuant to NHPA requirements. The proposed action does not adversely affect archaeological resources, would have no effects to historic properties, and would not result in effects to cultural resources. For these reasons, the proposed action, when added to past, present and reasonably foreseeable future actions, would have less than significant effects to cultural resources.

Terrestrial Biological Resources. While the proposed action, along with the activities in Table 4.3-1, contribute to the continued urban buildup of the Mōkapu Peninsula, construction-related projects would occur at previously developed and actively used areas. Construction noise would be temporary and similar to operational activities that currently occur throughout the installation. Operational noise of the upgraded WRF would be identical to noise generated by operation of the existing WRF. In addition, BMPs identified in Table 2.2-1 would be applied to future projects to further avoid or minimize potential effects to wildlife (including ESA-listed species) during the construction. BMPs to educate contractors and military personnel about natural resources and ESA-listed species would also continue to be implemented. The projects in Table 4.3-1 are largely upgrades to or replacement of existing infrastructure; therefore, the nature of the projects would not significantly introduce new noise sources nor significantly increase the amount of impervious surfaces at MCBH Kaneohe Bay. In addition, the USFWS reviewed the current status of ESA-listed species, the environmental baseline for the action area, the effects of the proposed construction and operation of the WRF upgrade, and the cumulative effects. USFWS concluded that the proposed action is not likely to jeopardize the continued existence of ESA-listed species. For these reasons, the proposed action, when added to past, present and reasonably foreseeable future actions, would have less than significant effects to terrestrial biological resources.

Utilities. The proposed action would have less than significant effects to utilities (see Section 3.6, *Utilities*) because the existing utilities system is adequate for the construction and operations of the

upgraded WRF. There would be either no effect or beneficial effect (for wastewater system) to utilities from the proposed action. Regarding capacity, none of the utilities (power, water, wastewater, solid waste, and information technology/communications) servicing the proposed action or the other projects in Table 4.3-1 are at capacity. The proposed action would not contribute to a change in demand for utility services at MCBH Kaneohe Bay. Other projects in Table 4.3-1 include electrical modernization projects that will be complete by 2030. This modernization would improve the electrical utilities system on base. At any given time, no more than three construction projects would be underway, including the proposed action. Even at three times the volume, the proposed construction components would still represent a very small percentage increase above existing utility usage. Consequently, actions identified in Table 4.3-1 would not individually or collectively exceed the capacity of the various utility systems. Furthermore, operation of the upgraded WRF would involve an increase of five personnel, which is not a substantial change to personnel currently working or residing at MCBH Kaneohe Bay. For these reasons, the proposed action, when added to past, present and reasonably foreseeable future actions, would have less than significant effects to utilities.

Transportation. Transportation associated with MCBH Kaneohe Bay construction projects may overlap in time with those in some of the projects in Table 4.3-1 and may contribute to traffic on roadways on H-3. The construction portion of the proposed action would increase average daily traffic volume on H-3 by less than 1 percent. At any given time, no more than three construction projects would be underway, including the proposed action. Even at three times the volume, the proposed construction components would still represent a very small percentage increase above existing average daily traffic volume on H-3. As such, construction would not result in a significant cumulative effect. Furthermore, operation of the upgraded WRF would involve an increase of five personnel, which is not a substantial change to personnel currently working or residing at MCBH Kaneohe Bay. For these reasons, the proposed action, when added to past, present and reasonably foreseeable future actions, would have less than significant effects to transportation.

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Appendix A
REGULATORY SETTING

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Appendix A: Regulatory Setting

The Marine Corps has prepared this Environmental Assessment (EA) based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the proposed action:

- American Indian Religious Freedom Act (42 United States Code [U.S.C.] 1996)
- Archeological and Historic Preservation Act (54 U.S.C. sections 312501–312508)
- Archaeological Resources Protection Act (16 U.S.C sections 470aa–470mm)
- Chapter 344, State Environmental Policy
- Clean Air Act (42 U.S.C. sections 7401–7671q)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Energy Independence and Security Act, United Facilities Criteria 3-210-10
- Executive Order (EO) 11988, Floodplain Management (42 Federal Register 26951)
- EO 11990, Protection of Wetlands (42 Federal Register 26961)
- EO 12088 as amended, Federal Compliance with Pollution Control Standards
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, and the Migratory Bird Treaty Act (66 Federal Register 3853, 16 U.S.C. sections 703–712)
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management (72 Federal Register 3919)
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136 et seq.)
- Hawai‘i Coastal Zone Management Program
- Hawai‘i State Plan
- Marine Corps Environmental Compliance and Protection Program (Marine Corps Order 5090.2)
- Migratory Bird Treaty Act (16 U.S.C. section 703 et seq.)
- National Environmental Policy Act (NEPA), 42 U.S.C. sections 4321-4370h
- Navy procedures for implementing NEPA (42 U.S.C. section 4331; 40 C.F.R. parts 1500–1508; 32 C.F.R. part 775)
- National Historic Preservation Act of 1966, as amended (54 U.S.C. 100101 et seq.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. sections 3001-3013)
- Noise Control Act (42 U.S.C. section 4901 et seq.)
- O‘ahu General Plan
- Policies and Responsibilities for Implementation of the National Environmental Policy Act Within the Department of the Navy (32 Code of Federal Regulations [C.F.R.] part 775)
- Pollution Prevention Act (NPA), 42 U.S.C. sections 13101-13109
- Protection of Historic Properties, 36 C.F.R. Part 800
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Safe Drinking Water Act (42 U.S.C. section 300f et seq.)
- State of Hawai‘i Energy Goal
- Toxic Substances Control Act (15 U.S.C. sections 2601 et seq.)

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Appendix B
PUBLIC COMMENTS AND RESPONSES

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Appendix B: Public Comments and Responses

ENVIRONMENTAL ASSESSMENT

WATER RECLAMATION FACILITY UPGRADE MARINE CORPS BASE HAWAII

O‘AHU, HAWAI‘I

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List of Tables

Abbreviations and Acronyms

DOH	Hawai'i State Department of Health
EA	Environmental Assessment
ESA	Endangered Species Act
ICRMP	Integrated Cultural Resources Management Plan
KRWWTP	Kailua Regional Wastewater Treatment Plant
MCBH	Marine Corps Base Hawaii
NAGPRA	Native American Graves Protection and Repatriation Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
SHPO	Hawai'i State Historic Preservation Officer
USFWS	U.S. Fish and Wildlife Service
WRF	Water Reclamation Facility

Appendix B: Public Comments and Responses

B.1 Overview of Comments and Responses

B.1.1 Timing and Methods of Comment Submittal

The 30-day public comment period provided an opportunity for government agencies, interest groups, and the general public to comment on the Draft Environmental Assessment (EA) for the proposed upgrade of the existing Water Reclamation Facility (WRF) at Marine Corps Base Hawaii (MCBH) Kaneohe Bay. The proposed action would occur at MCBH Kaneohe Bay in O'ahu, Hawai'i.

There were two primary methods to submit comments: (1) written comments by mail and (2) written comments by email. The Marine Corps published a notice of availability for the review of the Draft EA in the *Honolulu Star-Advertiser* on April 8, 2025. The public had 30 days to comment on the EA, as well as the Section 106 process to date.

This appendix contains all comments received during the public comment period. All received comments were assessed and considered individually and collectively during development of this Final EA. Based on the comments, clarifications and improvements were made in the Final EA. Written responses were prepared for all comments and are included in this appendix.

B.1.2 Comment Responses Process

The Marine Corps implemented the following process for reviewing and responding to all comments received during the public comment period for the Draft EA:

- The Marine Corps carefully reviewed all comments and assigned a unique identifier to each. Comment letters for which distinct and separable points could be identified and addressed were delineated and, where appropriate, subdivided into numbered "sub-comments." In certain cases, the commenter subdivided their own letter into sub-paragraphs.
- Resource specialists and Marine Corps authorities considered all comments and prepared written responses.
- As a result of the comments, the Marine Corps modified the Final EA to improve or clarify the analysis presented in the Draft EA.

B.1.3 Summary of Draft EA Public Comments

A total of three comments were received in response to the Draft EA. Table B-1 shows a breakdown of the number of comments received by agency, organization, and the public.

Table B.1-1 Summary of Comments Received During Public Review of the Draft EA

Commenter	*Number of Comments Received*
Agency	2
Organization	1
General Public	0
Total	3

B.1.4 Summary of Revisions to the Final EA in Response to Public Comments

The main revisions to the Final EA in response to public comments are summarized below.

- Section 1.4, *Purpose of and Need for the Proposed Action*. Revised to include the public review of the Draft EA and updates for agency consultations.
- Section 1.7, *Public and Agency Participation and Intergovernmental Coordination*. Revised to include the public review of the Draft EA and updates for agency consultations.
- Section 2.1, *Proposed Action*. Clarified that barbed wire is a required component of new construction at MCBH Kaneohe Bay for security and safety purposes, clarified that treated effluent is discharged into a shared outfall pipe with the Kailua Regional Wastewater Treatment Plant, and updated recycled water usage.
- Section 2.2.4, *Best Management Practices*. Updated conservation measures per the 2025 U.S. Fish and Wildlife Service (USFWS) Biological Opinion.
- Section 3.3, *Water Resources*. Clarified construction and operation discussions.
- Section 3.4, *Cultural Resources*. Clarified best management practices for archaeological monitoring.
- Section 3.5, *Terrestrial Biological Resources*. Updated based on the formal Section 7 Endangered Species Act (ESA) consultation.
- Section 3.6, *Utilities*. Clarified recycled water usage.
- Appendix B, *Public Comments and Responses*. Included public comments and responses.
- Appendix D, *Endangered Species Act Section 7 Consultation*. Updated with 2025 USFWS Biological Opinion.

B.1.5 Responses to Public Comments

Table B-2 presents responses to the public comments received about the Draft EA. In the case of longer comment letters, the table shows responses to the excerpted portions of the letters that appeared to represent comments about the Draft EA. The full original comment letters and emails are included after the table. However, please note that the original comment letters that follow Table B-2 could not be made compliant with Section 508 of the Rehabilitation Act of 1973 and therefore may not be processed by assistive technologies used by people with physical, sensory, or cognitive disabilities. The comments and excerpted portions of longer letters and emails included in Table B-2 are fully compliant with Section 508 and assistive technologies.

Table B.1-2 Responses to Public Comments

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
1.0	Board of Water Supply City of Honolulu		
1.1		The Board of Water Supply appreciates Marine Corps Base Hawai'i (MCBH) continued efforts to reduce potable water consumption. Proposed improvements to the water reclamation facility (WRF) to produce R-1 effluent should yield additional opportunities to reduce potable water consumption. We acknowledge that the expected WRF upgrade timeframe of FY25 through 28 is consistent with Colonel J. W. Beaven's response dated October 17, 2024, regarding MCBH's commitment to reduce average day consumption to at or below 2 million gallons per day over the course of a year. Attached for reference is a copy of the response letter. An estimated average day potable water savings from irrigating Klipper Golf Course with R-1 water should be provided. In addition to Klipper Golf Course, MCBH should identify other on-base areas to utilize R-1 effluent during off-peak hours. Recommended locations and uses include irrigation of large, landscaped parks or fields, planter strips, tree lawns, and buffer zones; vehicle wash rack areas; cooling towers; and toilet flushing. A map showing these additional R-1 effluent users should be provided.	Thank you for your comment. In 2024, the MCBH Klipper golf course used an average of between 100,000 to 300,000 gallons of potable water per day for irrigation. Under an agreement with the Board of Water Supply, MCBH limits the maximum daily usage to 300,000 gallons per day. However, the desired demand of the Klipper Golf Course is approximately 1-million gallons per day during the dry summer months, which is consistent with the base's historical use of R-2 water for irrigation. Use of R-1 water for in-plant water WRF operations and maintenance and for irrigation of the MCBH Klipper golf course would reduce the amount of treated water sent to the effluent outfall in Kailua Bay and would represent a potable water savings of 36,500,000 to 109,500,000 gallons annually. There is no planned R-1 use outside the MCBH Klipper Golf Course, but it may be studied in the future.
1.2		Water conservation measures are encouraged for existing MCBH developments and the proposed WRF upgrade project. These conservation measures may include utilization of nonpotable water for irrigation, using rain catchments,	MCBH implements water conservation for construction and activities on base. In addition, the proposed action conserves water because it would result in the ability to reuse R-1 level water at the WRF and at the Klipper Golf

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
		combination of drought tolerant plants and xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets. On-site reuse can be tied to green infrastructure and low impact development standards to retain stormwater on property for nonpoint source pollution control and to promote reuse and recharge. Effluent chloride levels of the existing WRF and mitigative actions to reduce saltwater intrusion into the sewer system should be investigated. Please continue to review your water use activities and check for leaks to help lower water consumption, which can reduce MCBH's overall expenses. We greatly appreciate your cooperation and support in helping us with this important responsibility.	Course, reducing the overall water demand from the City and County of Honolulu Board of Water Supply. MCBH investigated effluent chloride levels with DOH and took appropriate actions to reduce future levels, including amending the NPDES permit. MCBH has initiated an infiltration and inundation study to identify sanitary sewer lines that are likely to be impacted by ground water intrusion and/or storm flows. A future study will be used by MCBH to prioritize corrective actions and repairs to the sanitary sewer network with the overall goal of reducing the amount on non-sanitary wastewater (groundwater, storm water) that is entering the WRF treatment process.
2.0	He‘eia National Estuarine Research Reserve		
2.1		The He‘eia National Estuarine Research Reserve (NERR) is in support of this project, and is appreciative of the research and planning that is presented in this EA, especially the attention to native birds (water and migratory). The treatment facility upgrade will reduce the likelihood of discharging pollutants, thereby benefiting the surrounding community and ecosystems. In addition, the Klipper golf course and other non-residential uses of water on the Marine Base are not public trust uses. The reuse of treated wastewater would create significant water savings which could be accrued to public trust purposes,	Thank you for your comment. MCBH will continue to participate in the Readiness and Environmental Protection Integration (REPI) Program to support cost-sharing agreements between the military, federal agencies, and state and local government. These partnerships facilitate greater connection with the community in Hawai‘i to protect working lands (e.g., farms, forests, ranches), wildlife habitat, water resources, natural spaces for recreational opportunities, and threatened and endangered species.

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
		including supporting instream and nearshore ecosystems and traditional and customary practices such as loʻi kalo and loko iʻa. These public trust uses of water currently exist within the ahupuaʻa of Heʻeia that includes Mōkapu and the Marine Corps Base. These public trust activities in the Base's community are limited by the current streamflow, which remains at less than half of its historical average. Creating water savings of 1 million gallons per day would create the potential for restoring Heʻeia stream to its pre-diversion levels.	The proposed action would have beneficial effects to potable water through use of recycled water. This would reduce the overall water demand from the City and County of Honolulu Board of Water Supply and the amount of effluent discharged to the municipal outfall. The proposed action would also improve water treatment from secondary to tertiary treatment, allowing disinfection for 100 percent of the effluent treated by the system and thereby improving the quality of the treated water.
2.2		Responding to Page 3-19 Item 3.4.2.2: How much fill material would be needed for this project? And can another fill material be sourced and used, in replacement of sand? We are concerned that there will be more harvesting from the northern dunes that are historically known to have burials. If the reasoning for harvest fill from sand dunes is solely to save on costs on material and transport, we would recommend that this project considers alternatives that would reduce both the possibility of disturbing more burials, and also help to reduce the impact on additional harvesting from an already eroding coastline, especially in the light of sea level rise and loss of beaches.	Construction fill material would not be taken from any areas with sensitive cultural resources. The statement about fill materials relates to use of fill sand mined from the northern dunes (the Mōkapu Burial Area) during the 1930s and 1940s, not fill associated with the proposed action. The Final EA has been updated to clarify this point.
2.3		Please also make sure that the cultural monitor is working with the State Historic Preservation Division and lineal descendants in the monitoring.	The proposed action will include archaeological monitoring to minimize effects to any cultural resources, including human remains (ʻiwi kūpuna), that may be present in the historic fill material in the project area and are protected under NAGPRA. Any find will incorporate requirements of NAGPRA and applicable

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
			SOPs described in the 2021 MCBH ICRMP, which include notifications and coordination as required. The Marine Corps will provide the SHPO with an archaeological monitoring report within 90 calendar days from the end of ground-disturbing work.
2.4		Responding to 2.1.2 Page 2.6: We are supportive of using R-1 recycled water to irrigate the Klipper Golf Course. When will the use of treated water for the golf course be able to commence? The report states that the chlorination system is currently inoperable, and this was previously used to treat water to a level for use on landscaped areas. Is this the main barrier to use of treated water on the golf course, and if so, when will this component of the system be operational? Also is there a breakdown of the average daily water use of the Klipper Golf Course?	Use of R-1 at the WRF and the Klipper Golf Course is anticipated to begin upon project completion (estimated to be 2029), but it is additionally subject to DOH Wastewater Branch approval and permitting. MCBH intends to coordinate the permitting process through DOH during the construction process so that R-1 water can be used as soon as possible. The current chlorination system which is capable of treating wastewater to R-2 recycled standards is currently offline as the DOH wastewater branch has deemed it no longer meets Hawai‘i Administrative Rule guidelines for an R-2 system. MCBH continues to work with DOH to evaluate alternatives to restarting R-2 usage at the Klipper Golf Course as an interim measure until the R-1 system is constructed; however, those efforts are outside the scope of this EA. Currently, the Klipper Golf Course typically uses between 100,000 and 300,000-gallons of potable water per day for irrigation, depending on weather conditions. Under an agreement with the Board of Water Supply, MCBH limits the maximum daily usage to 300,000 gallons per day. However, the desired demand of the Klipper Golf Course is approximately 1-million

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
			gallons per day during the dry summer months, which is consistent with the base's historical use of R-2 water for irrigation.
2.5		Responding to 2.1.1.6 Page 2-6: We support planning for tsunami and sea-level rise. We question whether planning for 1.3 feet of sea-level rise is adequate. Current science suggests that there is a >50% probability of this sea level projection being exceeded by 2100. What is the expected lifetime of the upgraded facility, and what are the projections for future sea-level rise in that timeframe? For longer-term, high risk infrastructure, we suggest planning for 3.8 ft average sea level rise by 2100, which is an intermediate level projection at the Moku o Loʻe tide gauge station. (See https://urldefense.com/v3/__https://sealevel. nasa.gov/task force-scenario-tool/?psmsl_id=8 23__;!!PvDODwlR4mBZyAb0!S75pDFiB9PACiH Gyws0xHEHZvLLaJ73aUapaI5zdemvkshncxE_a M1oureRlUREM9vDlL5HEwcE-StWr7fbCY6E$) Site specific factors and extreme events such as king tides should also be taken into account. (See https://www.pacioos.hawaii.edu/shoreline/slrhawaii/	New facilities constructed as a part of the upgrade to the WRF would be consistent with tsunami design standards in the American Society of Civil Engineers 7-16 Tsunami Geodesign Database. The Unified Facilities Criteria 3-301-01 Structural Engineering provides requirements for structures designed and constructed for the DoD. The design for potential sea level rise is consistent with DoD planning parameters for coastal construction projects. The site-specific value from the DoD Regional Sea Level database corresponds to the designated scenario for the year 2065. The Final EA was updated to clarify this point.
3.0	Kailua Neighborhood Board		
3.1		1. The Final Environmental Assessment (FEA) should evaluate the possibility of Marine Corps Base Hawaii constructing its own outfall sewer line to terminate in Kaneohe Bay on the opposite side of the peninsula from Kailua Bay. This action would divert	Thank you for your comment. The MCBH WRF has no impact to operations of the Kailua Regional Wastewater Treatment Plant (KRWWTP), and a reduction in effluent from the WRF would not impact KRWWTP's ability to

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
		about 2 million gallons per day of treated wastewater from the Kailua Wastewater Treatment sewer line and into Kailua Bay. It is hoped that diverting approximately 2 million gallons per day will relieve stress on Kailua's aging and heavily used system and help prevent sewage spills into Kailua Bay.	treat their incoming wastewater. The WRF and KRWWTP only share an effluent pipeline as permitted by the individual NPDES permits for each facility. Further, this project proposes to reduce the overall amount of effluent sent to the outfall through the construction of an R-1 recycled water system. This system would be used to irrigate the Klipper Golf Course which represents a maximum daily diversion of approximately 100,000 to 300,000 gallons per day from being sent to the outfall.
3.2		2. The FEA should include a requirement that should `iwi be found during construction or any ground disturbance that all work will stop with OHA and ohana being notified immediately.	The proposed action will include archaeological monitoring to minimize effects to any cultural resources, including human remains (ʻiwi kūpuna), that may be present in the historic fill material in the project area and are protected under NAGPRA. Should `iwi be encountered during ground-disturbing activities, work will stop in accordance with the MCBH ICRMP. The Marine Corps will provide the SHPO with an archaeological monitoring report within 90 calendar days from the end of ground-disturbing work.
3.3		3. The FEA states that approximately 2,100 linear feet of security fencing would include three strands of barbed wire fencing which poses a risk of entanglement for the Hawaiian hoary bat. The fence totaling approximately 6,300 linear feet with a height of eight feet will enclose the entire wastewater treatment facility.	Figure 2.1-1 in the EA shows the proposed location of the fence around the WRF, which includes barbed wire, and it is described in Section 2.1.1.7. The legend was updated to clarify barbed wire fencing is included in the proposed fencing.

Comment Number	*Name*	*Comment* (*including excerpts from longer letters/emails as noted below)*	*Response*
		a. The FEA should include a map of the areas where barbed wire fencing could impact the Hawaiian hoary bat (`ope`ape`a).	
3.4		b. The DEA states that "the compound is enclosed with chain-link fence and has been for decades. The fence does not currently have barbed wire." c. In the FEA explain what problem placing barbed wire on top of a 7-foot fence is trying to solve and identify the areas and number of times the 7-foot fence has been breached and the impacts of that breach. d. The Kailua Neighborhood Board recommends increasing the height of the chain-link fence, instead of adding 1-foot of barbed wire, to protect Hawaii's only native terrestrial mammal, the Hawaiian hoary bat (ope`ape`a), which is both federally and state listed as endangered.	Barbed wire is a required component of new construction at MCBH for security and safety purposes. It helps prevent unauthorized access, ensure safety, and protect the property from vandalism. Section 2.1.1.7 of the Final EA was updated to clarify this component. This component of the proposed action was fully analyzed in the EA and in the U.S. Fish and Wildlife Service Biological Opinion for Section 7 Endangered Species Act consultation (Appendix D of the EA).

Legend: DoD = Department of Defense; DOH = Hawai'i State Department of Health; DEA = Draft Environmental Assessment; EA = Environmental Assessment; FEA = Final Environmental Assessment; ICRMP = Integrated Cultural Resources Management Plan; MCBH = Marine Corps Base Hawaii; NAGPRA = Native American Graves Protection and Repatriation Act; NHPA = National Historic Preservation Act; NPDES = National Pollutant Discharge Elimination System; SHPO = Hawai'i State Historic Preservation Officer; WRF = Water Reclamation Facility

Comment 01

BOARD OF WATER SUPPLY
KA 'OIHANA WAI
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET • HONOLULU, HAWAI'I 96843
Phone: (808) 748-5000 • www.boardofwatersupply.com

RICK BLANGIARDI
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ERNEST Y. W. LAU, P.E.
MANAGER AND CHIEF ENGINEER
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ERWIN KAWATA
DEPUTY MANAGER
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BRYAN P. ANDAYA
LANCE WILHELM
KĒHAULANI PU'U
EDWIN H. SNIFFEN, Ex-Officio
GENE C. ALBANO, P.E., Ex-Officio

April 28, 2025

Mr. Peer Amble
Stantec GS Inc.
737 Bishop Street, Suite 3050
Honolulu, Hawai'i 96813

Dear Mr. Amble:

Subject: Your Notice Dated April 2025 Requesting Comments on the Draft Environmental Assessment for the Water Reclamation Facility Upgrade Project at Marine Corps Base Hawai'i – Tax Map Key: 4-4-008: 001

Thank you for your letter regarding the proposed water reclamation facility upgrade project.

The Board of Water Supply appreciates Marine Corps Base Hawai'i (MCBH) continued efforts to reduce potable water consumption. Proposed improvements to the water reclamation facility (WRF) to produce R-1 effluent should yield additional opportunities to reduce potable water consumption.

We acknowledge that the expected WRF upgrade timeframe of FY25 through 28 is consistent with Colonel J. W. Beaven's response dated October 17, 2024 regarding MCBH's commitment to reduce average day consumption to at or below 2 million gallons per day over the course of a year. Attached for reference is a copy of the response letter.

An estimated average day potable water savings from irrigating Klipper Golf Course with R-1 water should be provided. In addition to Klipper Golf Course, MCBH should identify other on-base areas to utilize R-1 effluent during off-peak hours. Recommended locations and uses include irrigation of large, landscaped parks or fields, planter strips, tree lawns, and buffer zones; vehicle wash rack areas; cooling towers; and toilet flushing. A map showing these additional R-1 effluent users should be provided.

Comment 01 (continued)

Mr. Peer Amble
April 28, 2025
Page 2

Water conservation measures are encouraged for existing MCBH developments and the proposed WRF upgrade project. These conservation measures may include utilization of nonpotable water for irrigation, using rain catchments, combination of drought tolerant plants and xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets. On-site reuse can be tied to green infrastructure and low impact development standards to retain stormwater on property for nonpoint source pollution control and to promote reuse and recharge.

Effluent chloride levels of the existing WRF and mitigative actions to reduce saltwater intrusion into the sewer system should be investigated.

Please continue to review your water use activities and check for leaks to help lower water consumption, which can reduce MCBH's overall expenses. We greatly appreciate your cooperation and support in helping us with this important responsibility.

If you have any questions, please contact Barry Usagawa, Water Resources Division at (808) 748-5900.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachment

Comment 01 (continued)

ATTACHMENT

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAI'I
BOX 63002
KANEOHE BAY HAWAI'I 96863-3002

IN REPLY REFER TO:
11011
CO
October 17, 2024

Ernest Y. W. Lau, P.E.
Manager and Chief Engineer
630 South Beretania Street
Honolulu, HI 96843

Dear Mr. Lau:

Thank you for your letter regarding water consumption aboard Marine Corps Base Hawai'i (MCBH), Kāne'ohe Bay. The data provided in your letter exemplifies the effectiveness of our water conservation efforts as monthly consumption since 2022 has decreased significantly. We are committed to continuing this trend and our goal remains to maintain our average daily water consumption at or below 2 million gallons per day (MGD) over the course of a year.

As noted in my April 5, 2024 letter, we have a project in design to construct a new effluent disinfection system at our Water Reclamation Facility (WRF) that will enable reimplementation of our R-2 irrigation system for the Klipper Golf Course. Award of the project is projected in the fourth quarter of FY25 and projected completion is January 2027. In the interim, my Facilities team continues their coordination with Hawai'i Department of Health to determine what can be done to resume use of our R-2 water to irrigate the Klipper Golf Course. In addition, we received the first increment of funding for a Military Construction project to add redundancy and improve monitoring and control systems at our WRF. Award of this project is also expected in the fourth quarter of FY25. Upon completion of the project in late FY28, the WRF will be capable of producing R-1 effluent that can used for a variety of industrial and irrigation purposes. Our R-1 reuse engineering study remains on schedule for contract award in the first quarter of FY25 and is likely to be completed by the first quarter of FY26. In the coming years, I see our potable water consumption decreasing substantially as we recycle WRF effluent to not only irrigate the Klipper Golf Course, but irrigate other areas of the base and use the water in cooling towers, wash racks and a variety of other purposes throughout the base.

MCBH remains committed to meeting the intent of the Water Service Specifications "A" Amendment under contract N62742-77-C-0209, dated 9 September 1985, pertaining to Marine Corps Air Station Kaneohe Bay. Specifically, the estimated annual consumption of 700 MG and estimated daily maximum demand of 3 MGD, noting that the Amendment states that the Government is not restricted to those estimates.

I deeply appreciate the update and continued discourse with your team in support of our shared water use reduction goals. I look forward to being able to report further progress on our initiatives over the next few years.

Sincerely,

J. W. BEAVEN
Colonel, USMC
Commanding Officer
Marine Corps Base Hawaii

Comment 02

Heʻeia National Estuarine Research Reserve

Koʻolaupoko, Oʻahu, Hawaiʻi

Comments on "Water Reclamation Facility Upgrade Marine Corps Base Hawaii -- Draft Environmental Assessment (EA)"

Thank you for the opportunity to ask questions and provide comments on the Draft Environmental Assessment (EA) for the Water Reclamation Facility Upgrade for the Marine Corps Base Hawaiʻi. The Heʻeia National Estuarine Research Reserve (NERR) is in support of this project, and is appreciative of the research and planning that is presented in this EA, especially the attention to native birds (water and migratory). The treatment facility upgrade will reduce the likelihood of discharging pollutants, thereby benefiting the surrounding community and ecosystems.

In addition, the Klipper golf course and other non-residential uses of water on the Marine Base are not public trust uses. The reuse of treated wastewater would create significant water savings which could be accrued to public trust purposes, including supporting instream and nearshore ecosystems and traditional and customary practices such as loʻi kalo and loko iʻa. These public trust uses of water currently exist within the ahupuaʻa of Heʻeia that includes Mōkapu and the Marine Corps Base. These public trust activities in the Base's community are limited by the current streamflow, which remains at less than half of its historical average. Creating water savings of 1 million gallons per day would create the potential for restoring Heʻeia stream to its pre-diversion levels.

The Heʻeia NERR has a few questions and comments are summarized in the table below:

Item	Page	Quoted text	Comment
3.4.2.2	3-19	*"Although primarily located in an area of filled land with no potential for NRHP-eligible archaeological sites to be present, the possibility of fill sand mined from the northern dunes (the Mōkapu Burial Area) containing human remains creates the potential for effects to archaeological resources."*	How much fill material would be needed for this project? And can another fill material be sourced and used, in replacement of sand? We are concerned that there will be more harvesting from the northern dunes that are historically known to have burials. If the reasoning for harvest fill from sand dunes is solely to save on costs on material and transport, we would recommend that this project considers alternatives that would reduce both the possibility of disturbing more burials, and also help to reduce the impact on additional harvesting from an already eroding coastline, especially in the light of sea level rise and loss of beaches. Please also make sure

Comment 02 (continued)

He'eia National Estuarine Research Reserve

Ko'olaupoko, O'ahu, Hawai'i

			that the cultural monitor is working with the State Historic Preservation Division and lineal descendants in the monitoring.
2.1.2.	2-6	*"The R-1 recycled water could be used for irrigation at the Klipper Golf course, thus reducing overall water demand from the City and County of Honolulu Board of Water Supply and a reduction in volume of effluent discharged into Kailua Bay. No change would occur to the pipe distribution system between the WRF and the Klipper Golf Course."*	We are supportive of using R-1 recycled water to irrigate the Klipper Golf Course. When will the use of treated water for the golf course be able to commence? The report states that the chlorination system is currently inoperable, and this was previously used to treat water to a level for use on landscaped areas. Is this the main barrier to use of treated water on the golf course, and if so, when will this component of the system be operational? Also is there a breakdown of the average daily water use of the Klipper Golf Course?
2.1.1.6	2-6	*The designed upgrades would account for a maximum tsunami water inundation elevation of 21.3 feet above mean sea level, a peak flow velocity of 20 feet per second, and a future sea level rise of 1.3 feet at the site.*	We support planning for tsunami and sea-level rise. We question whether planning for 1.3 feet of sea-level rise is adequate. Current science suggests that there is a >50% probability of this sea level projection being exceeded by 2100. What is the expected lifetime of the upgraded facility, and what are the projections for future sea-level rise in that timeframe? For longer-term, high risk infrastructure, we suggest planning for 3.8 ft average sea level rise by 2100, which is an intermediate level projection at the Moku o Lo'e tide gauge station. (See https://urldefense.com/v3/__https://sealevel.nasa.gov/task-force-scenario-tool/?psmsl_id=823__;!!PvDODwlR4mBZyAb0!S75pDFiB9PACiHGyws0xHEHZvLLaJ73aUapaI5zdemvkshncxE_aM1oureRlUREM9vDlL5HEwcE-StWr7fbCY6E$) Site specific factors and extreme events such as king tides should also be taken into account. (See https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/)

Comment 03

KAILUA NEIGHBORHOOD BOARD NO. 31

WILLIAM M. HICKS, CHAIRMAN • 923 AKUMU STREET • KAILUA, HAWAII, 96734-4004
PHONE (808) 452-2761 • E-MAIL billhicksknb@gmail.com

May 7, 2025

Peer Amble
Stantec GS Inc.
MCBH.WRF.EA@stantecgs.com

Subject: Kailua Neighborhood Board Comments on the Marine Corps Base Hawaii Water Reclamation Facility Upgrade Environmental Assessment

Aloha Peer Amble,

The Kailua Neighborhood Board (KNB) reviewed the Marine Corps Base Hawaii Water Reclamation Facility Upgrade Environmental Assessment posted at https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/Water-Reclamation-Facility-Upgrades-EA/

The following resolution was unanimously approved by the KNB at the regular meeting on May 1, 2025:
The Kailua Neighborhood Board submits the following comments on the 2025 DEA Water Reclamation Facility Upgrade at Marine Corps Base Hawaii.
1. The Final Environmental Assessment (FEA) should evaluate the possibility of Marine Corps Base Hawaii constructing its own outfall sewer line to terminate in Kaneohe Bay on the opposite side of the peninsula from Kailua Bay. This action would divert about 2 million gallons per day of treated wastewater from the Kailua Wastewater Treatment sewer line and into Kailua Bay. It is hoped that diverting approximately 2 million gallons per day will relieve stress on Kailua's aging and heavily used system and help prevent sewage spills into Kailua Bay.
2. The FEA should include a requirement that should `iwi be found during construction or any ground disturbance that all work will stop with OHA and ohana being notified immediately.
3. The FEA states that approximately 2,100 linear feet of security fencing would include three strands of barbed wire fencing which poses a risk of entanglement for the Hawaiian hoary bat. The fence totaling approximately 6,300 linear feet with a height of eight feet will enclose the entire wastewater treatment facility.
   a. The FEA should include a map of the areas where barbed wire fencing could impact the Hawaiian hoary bat (`ope`ape`a).
   b. The DEA states that "the compound is enclosed with chain-link fence and has been for decades. The fence does not currently have barbed wire."
   c. In the FEA explain what problem placing barbed wire on top of a 7-foot fence is trying to solve and identify the areas and number of times the 7-foot fence has been breached and the impacts of that breach.
   d. The Kailua Neighborhood Board recommends increasing the height of the chain-link fence, instead of adding 1-foot of barbed wire, to protect Hawaii's only native terrestrial mammal, the Hawaiian hoary bat (ope`ape`a), which is both federally and state listed as endangered.

We trust your final Environmental Assessment will address these concerns.

Aloha,

William M. Hicks

William M. Hicks
Chairman, Kailua Neighborhood Board

Copy:

Comment 03 (continued)

U.S. Representative Jill Tokuda's Representative Nicole Gray Nicole.Gray@mail.house.gov
Marine Corps Base Hawaii Representative Kristi Kaluhiwa Kristi.kaluhiwa@usmc.mil

Appendix C
NATIONAL HISTORIC PRESERVATION ACT
SECTION 106 CONSULTATION

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STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

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

June 12, 2025

IN REPLY REFER TO:
Project No.: 2024PR01402
Doc. No.: 2412SH19
Archaeology
Architecture

Captain Ryan LaLonde
Environmental Compliance and Protection Department
United States Marine Corps
Marine Corps Base Hawai'i Box 63002
Kaneohe Bay, Hawai'i 96863-3002
Email: Ryan.d.Lalonde.mil@usmc.mil
Electronic Transmittal Only, No Hard Copy to Follow

Dear Captain LaLonde:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review – Continued Consultation and Request for Concurrence with the Effect Determination P-875 Water Reclamation Facility Redundancy Construction and Upgrades Aboard Marine Corps Base Hawai'i (MCBH)**
MCBH Ref. No. 5900 LFE/144-23
Kaneohe 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 26, 2024 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 P-875 Water Reclamation Facility Redundancy Construction and Upgrades project at MCBH on the island of O'ahu. The SHPD received this submittal on November 27, 2024 (HICRIS Submission No. 2024PR01402.001). On December 27, 2024, the SHPD requested information from MCBH related to their efforts to consult with the public and interested parties to consult and any responses received. MCBH provided documentation of the proposed consultation process on February 5, 2025 (HICRIS Submission No. 2024PR01402.002). MCBH submitted consulting party comments on May 14, 2025 (HICRIS Submission No. 2024PR01402.003) and June 6, 2025 (HICRIS Submission No. 2024PR01402.004).

MCBH's letter states the proposed project is to construct and operate a redundant wastewater treatment system at MCBH Kaneohe Bay. The project will be located at the existing Water Reclamation Facility (WRF) in the south-central portion of Mokapu Peninsula. It would enable the WRF to maintain full capacity during maintenance activities, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action will be constructed over a three-year period from Fiscal Year (FY) 2025 through FY 2028. The construction will be completed in phases to mitigate disruptions and maintain operation of the WRF. 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 states most of the proposed construction will occur on previously disturbed areas within the existing WRF footprint. The tree planting will occur in undeveloped landscaped area to the east of the WRF. No modifications to the ocean outfall would occur. After completion of the project, the upgraded WRF will operate like the existing WRF.

The new construction includes above-grade one and two-story concrete structures on deep piles (approximately 60 feet deep) with mat foundations, using augur-cast piles. Other excavation activities have a maximum depth of 18 feet. The new Grit Chamber, Clarifier, Equalization Tank, MBBR, DAF, Filters, Chlorine Contact Basins and Chemical Storage, R-1, and Digester will be designed as hydraulic basins in accordance with ACI 350-06. These new structures will have concrete walls supported on mat foundations with deep piles. Additional details are provided by MCBH in the letter received.

The MCBH has defined the area of potential effects (APE) as totaling 27 acres which includes the footprint of the P-875 WRF Redundancy project, including temporary contractor laydown areas, electrical/data/communication work, and the landscape area designated for tree planting east of the WRF.

The proposed project will demolish a number of WRF systems (sludge beds, fuel tank, generator) and Building 892 (Laboratory & Office) (1947) will be demolished. **SHPD concurs** that Building 892 is not eligible for the National Register of Historic Places (NRHP).

The MCBH did not identify any historic properties within the APE. The MCBH states however, that although there is no potential for encountering NRHP-eligible subsurface deposits or sites, all ground disturbing activities associated with the P-875 WRF Redundancy project shall be monitored by a qualified archaeologist as a best management practice due to the potential for dissociated cultural material, including human remains, to be present in dune sand used as construction material during initial base construction at MCBH Kaneohe Bay. **The SHPO requests** the monitoring archaeologist prepare an archaeological monitoring report that includes at minimum, any findings and information such as where ground disturbance occurred (based on reliable geographical spatial data) and geological descriptions and photos of the sediments and stratigraphy encountered across the project area.

The MCBH has determined the proposed undertaking will result in *no historic properties affected*. If the MCBH agrees to submitting archaeological monitoring report as requested above, within 90 calendar days from the end of ground disturbing work, then the SHPO concurs with the proposed effect determination. If the MCBH does not agree to the request, Section 106 consultation shall continue. Please notify the SHPO of MCBH's decision via HICRIS under Project No. 2024PR01402 using the Project Supplement option.

The MCBH states that the proposed undertaking would ensure MCBH complies with its Department of Health DOH discharge permit #HI0110078 for treatment of wastewater while components undergo repair or maintenance. **Please note**, any permit or approval from a state or local government requires compliance with Hawaii Revised Statutes Chapter 6E.

Please submit all forthcoming information and correspondence including, if necessary, documentation to satisfy Chapter 6E for this project, related to the subject project to SHPD via HICRIS under Project No. 2024PR01402 using the Project Supplement option. **If additional individuals need to be added as contributors, such as representatives from DOH**, to this HICRIS project number, please contact SHPD to have them designated as project contacts. This will grant them the ability to submit documents associated with the 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 Mary Kodama, Architecture Branch Chief, at Mary.Kodama@hawaii.gov, for matters regarding architectural resources or 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,

Dawn N. S. Chang, Esq.
DLNR Chairperson
State Historic Preservation Officer

cc: June Cleghorn, MCBH (june.cleghorn@usmc.mil)
Wendy Wichman, MCBH (wendy.j.wichman.ctr@usmc.mil)

From: Kaweni Ibarra <kawenii@oha.org>
Sent: Tuesday, June 3, 2025 7:21 AM
To: Cleghorn CIV June N <june.cleghorn@usmc.mil>; wendy.j.wichman@usmc.mil
Cc: Kai Markell <kaim@oha.org>; Kamakana Ferreira <kamakanaf@oha.org>
Subject: [Non-DoD Source] OHA Comment Re: NHPA Sect 106 Consult for Water Reclamation Facility, Kaneohe, Oahu

Aloha e Dr. Wichman and June,

The Office of Hawaiian Affairs (OHA) is in receipt of the your letter dated November 26, 2024, initiating National Historic Preservation (NHPA) Section 106 consultation for construction and upgrades to a Water Reclamation Facility at Kaneohe, Oahu.

OHA supports the decision to conduct archaeological monitoring for all ground disturbing activities. As the project proceeds, OHA requests to be notified of any inadvertent discoveries that occur during archaeological monitoring.

Additionally, OHA requests that we be provided with copies of any current and future comments provided by the State Historic Preservation Division (SHPD).

Mahalo for your time. We look forward to continuing consultation. Please feel free to contact me should you have any questions.

Mahalo,

Kaweni Ibarra

Kaweni Ibarra

Compliance Advocate

Office of Hawaiian Affairs

OFFICE OF HAWAIIAN AFFAIRS

From: Wichman CTR Wendy J <wendy.j.wichman.ctr@usmc.mil>
Sent: Wednesday, May 14, 2025 2:45 PM
To: susan.a.lebo@hawaii.gov; jessica.puff@hawaii.gov; '`Oahu Island Burial Council; c/o Regina Hilo' <regina.hilo@hawaii.gov>; Hacker, Stephanie <Stephanie.Hacker@hawaii.gov>; Ah Lan Diamond <kdiamond@waimeavalley.net>; Betsy Merritt <emerritt@savingplaces.org>; Clive Cabral (19clivepam73@gmail.com) <19clivepam73@gmail.com>; Cy Harris <ckharris808@gmail.com>; Keohokalole `Ohana Dennis Ka`imi Keohokalole <kalakaua@hotmail.com>; Paoa/Kea/Lono `Ohana, Donna Ann Camvel <donnaono@hawaii.edu>; kaleianuhea@gmail.com; Kaleleonalani Napoleon <kalele63@gmail.com>; wimills@ksbe.edu; Kiersten Faulkner <kiersten@historichawaii.org>; kulamanu18@gmail.com; Na'unanikina'u Kamali'i <kawaileolaw@hawaii.rr.com>; Ohacompliance@oha.org; Skye Razon-Olds <skyekro@gmail.com>; 'Terri Kekoolani' <napua4u@yahoo.com>; kamakanaf@oha.org; Keohokalole `Ohana, Emalia Keohokalole <eek4@hawaii.edu>; malian@hawaii.rr.com; Kaweni Ibarra <kawenii@oha.org>
Cc: Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Cleghorn CIV June N <june.cleghorn@usmc.mil>; LaLonde Capt Ryan David <ryan.d.lalonde.mil@usmc.mil>; Barkmeier CTR Jonathan H <jonathan.h.barkmeier.ctr@usmc.mil>; Thomas Santos <thomas.e.santos.civ@usmc.mil>
Subject: Section 106_LFE/144-23 Water Reclamation Facility (WRF) Redundancy Upgrades_MCBH (HICRIS #2024PR01402)

Aloha Consulting Parties,

In response to an inquiry from SHPD regarding the above subject Section 106 consultation, MCBH is providing the below information to consulting parties. This information was also submitted today to the SHPD HICRIS project folder #2024PR01402.

MCBH met 36 CFR 800.3(e) [public] and 800.3(f) [invited parties] in coordination with the above subject draft EA (DEA) public comment period. The DEA was provided for public comment from April 8 to May 8, 2025. MCBH also provided the public with additional information on our public website at: https://www.mcbhawaii.marines.mil/Resources-Services/Pertinent-Information/Water-Reclamation-Facility-Upgrades-EA/. Additionally, the MCBH Kaneohe Bay Public Affairs Officers notified the local community at monthly neighborhood meetings and other public engagement opportunities about the proposed action and the associated Draft EA public comment period. At the close of the public comment period, there were three public comments pertaining to cultural resources. These comments and MCBH responses will be included in the Final EA as shown below:

ORGANIZATION	COMMENTS	MCBH RESPONSES
2.2 He‘eia National Estuarine Research Reserve	Responding to Page 3-19 Item 3.4.2.2: How much fill material would be needed for this project? And can another fill material be sourced and used, in replacement of sand? We are concerned that there will be more harvesting from the northern dunes that are historically known to have burials. If the reasoning for harvest fill from sand dunes is solely to save on costs on material and transport, we would recommend that this project considers alternatives that would reduce both the possibility of disturbing more burials, and also help to reduce the impact on additional harvesting from an already eroding coastline, especially in the light of sea level rise and loss of beaches.	Construction fill material would not be taken from any areas with sensitive cultural resources. The statement about fill materials relates to use of fill sand mined from the northern dunes (the Mōkapu Burial Area) during the 1930s and 1940s, not construction fill associated with the proposed action. The Final EA has been updated to clarify this point

2.3 He‘eia National Estuarine Research Reserve	Please also make sure that the cultural monitor is working with the State Historic Preservation Division and lineal descendants in the monitoring.	The proposed action will include archaeological monitoring to minimize effects to any cultural resources, including human remains (‘iwi kūpuna), that may be present in the historic fill material in the project area and are protected under NAGPRA. Any find would incorporate requirements of NAGPRA and applicable SOPs described in the 2021 MCB Hawaii ICRMP, which include notifications and coordination as required.
3.2 The Kailua Neighborhood Board, by resolution on May 1, 2025.	The FEA should include a requirement that should `iwi be found during construction or any ground disturbance that all work will stop with OHA and ohana being notified immediately.	The proposed action will include archaeological monitoring to minimize effects to any cultural resources, including human remains (‘iwi kūpuna), that may be present in the historic fill material in the project area and are protected under NAGPRA. Should `iwi be encountered during ground disturbing activities, work would stop in accordance with NAGPRA. Required notifications would occur immediately, including OHA and ohana.

In addition, MCBH posted a separate Section 106 Public Notice regarding this undertaking on our public website at: https://www.mcbhawaii.marines.mil/Offices-Staff/S-4-Installations-Logistics/Facilities/Environmental/Cultural-Resources/NHPA-Section-106/. No comments or objections were received to this public notice or to our initial Section 106 submittal LFE/144-23 Section 106 P-875 Water Reclamation Facility Redundancy Construction and Upgrades aboard MCBH (HICRIS #2024PR01402.001) dated 11-26-2024 that was emailed to consulting parties.

In light of this information, MCBH has again respectfully requested that the SHPO concur with our finding as described in our initial submittal HICRIS #2024PR01402.001, dated 11/26/25. Please let us know within 30 days of receipt of this email if you have any objections to this finding. Additionally, MCBH will ensure that an archaeologist monitor all ground disturbing activities associated with this undertaking as a best management practice. Thank you.

Respectfully,

Wendy J Wichman, PhD

Cultural Resources Management

Environmental Compliance and Protection Division

Marine Corps Base Hawaii

ofice: 808.496.7134

mobile: 808.271.0853

NEW Email: wendy.j.wichman.ctr@usmc.mil

From: Wichman CTR Wendy J
Sent: Tuesday, November 26, 2024 6:01 PM
To: susan.a.lebo@hawaii.gov; jessica.puff@hawaii.gov; Regina Hilo; Stephanie.Hacker@hawaii.gov; Ah Lan Diamond; Anuhea Diamond; Betsy Merritt; Clive Cabral; Cy Harris; Dennis Keohokalole; Donna Ono; Kai Markell; Kaleleonalani Napoleon; Kamana'o Mills; kiersten@historichawaii.org; Manu Napoleon; Na'unanikina'u Kamali'i; ohacompliance@oha.org; Skye Razon-Olds; Terrilee Keko'olani Raymond
Cc: Hart Maj Jeffry P; Bomar CIV Jacquelyn C; Leger CIV Jessica K; Cleghorn CIV June N

Subject: Section 106_LFE/144-23 Water Reclamation Facility (WRF) Redundancy Upgrades_MCBH

Aloha All,

Please find attached our letter (LFE/144-23) initiating Section 106 consultation on the proposed Water Reclamation Facility (WRF) Redundancy Upgrades (P-875) project aboard Marine Corps Base Hawaii (MCBH). The project would construct and operate a redundant wastewater treatment plant at MCBH Kaneohe Bay.

Respectfully,

Wendy J Wichman, PhD

Cultural Resources Management

Environmental Compliance and Protection Division

Marine Corps Base Hawaii

ofice: 808.496.7134

mobile: 808.271.0853

NEW Email: wendy.j.wichman.ctr@usmc.mil

Environmental Support Contractor with The Center for Environmental Management of Military Lands (CEMML), Colorado State University. Website: cemml.colostate.edu. Email: wendy.wichman@colostate.edu.

From:	Wichman CTR Wendy J
To:	susan.a.lebo@hawaii.gov; jessica.puff@hawaii.gov; Regina Hilo; Stephanie.Hacker@hawaii.gov; Ah Lan Diamond; Anuhea Diamond; Betsy Merritt; Clive Cabral; Cy Harris; Dennis Keohokalole; Donna Ono; Kai Markell; Kaleleonalani Napoleon; Kamana"o Mills; kiersten@historichawaii.org; Manu Napoleon; Na"unanikina"u Kamali"i; ohacompliance@oha.org; Skye Razon-Olds; Terrilee Keko"olani Raymond; kamakanaf@oha.org; Keohokalole `Ohana; Emalia Keohokalole
Cc:	Hart Maj Jeffry P; Bomar CIV Jacquelyn C; Leger CIV Jessica K; Cleghorn CIV June N
Subject:	Section 106_LFE/144-23 Water Reclamation Facility (WRF) Redundancy Upgrades_MCBH
Date:	Tuesday, November 26, 2024 8:01:39 PM
Attachments:	LFE-144-23_Sec106_WRF_Redundancy_Upgrades_P-875_MCBH_signed.pdf

Aloha All,
Please find attached our letter (LFE/144-23) initiating Section 106 consultation on the proposed Water Reclamation Facility (WRF) Redundancy Upgrades (P-875) project aboard Marine Corps Base Hawaii (MCBH). The project would construct and operate a redundant wastewater treatment plant at MCBH Kaneohe Bay.

Respectfully,

Wendy J Wichman, PhD
Cultural Resources Management
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
ofice: 808.496.7134
mobile: 808.271.0853
NEW Email: wendy.j.wichman.ctr@usmc.mil

Environmental Support Contractor with The Center for Environmental Management of Military Lands (CEMML), Colorado State University. Website: cemml.colostate.edu. Email: wendy.wichman@colostate.edu.

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

5090
LFE/144-23
26 November 2024

Dr. Jessica Puff
Deputy State Historic Preservation Officer
Department of Land and Natural Resources
Kakuhihewa Building
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Dear Dr. Puff:

SUBJECT: SECTION 106 CONSULTATION: P-875 WATER RECLAMATION FACILITY REDUNDANCY CONSTRUCTION AND UPGRADES ABOARD MARINE CORPS BASE HAWAII, DISTRICT OF KOʻOLAUPOKO, AHUPUAʻA OF KANEOHE, 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 regarding the P-875 Water Reclamation Facility (WRF) Redundancy Construction and Upgrades (HI20220052) project aboard MCBH. This letter initiates our Section 106 consultation for this undertaking. The project is the subject of an Environmental Assessment.

PROJECT DESCRIPTION

The proposed undertaking is to construct and operate a redundant wastewater treatment system at MCBH Kaneohe Bay. The project will be located at the existing WRF in the south-central portion of Mokapu Peninsula [enclosure 1]. It would enable the WRF to maintain full capacity during maintenance activities, adhere to water quality and disinfection standards, introduce new water reuse capabilities on base, and comply with tsunami design requirements. The proposed action would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF, which is currently the only means for treating wastewater generated by the base.

The existing WRF uses a “single-train treatment process,” meaning it cannot operate effectively when components are offline for repair or maintenance. The facility treats water in accordance with National Pollutant Discharge Elimination System (NPDES) effluent limitations, and planned maintenance events occur in coordination with Hawaiʻi State Department of Health (DOH). The proposed undertaking would ensure MCBH complies with its DOH discharge permit #HI0110078 for treatment of wastewater while components undergo repair or maintenance. The proposed redundancy would also enable the base to achieve compliance with 40 Code of Federal Regulations (CFR) 122.41(4) by having adequate backup to ensure treated effluent continues to meet existing permit limitations during normal periods of equipment downtime. The proposed upgrade is also necessary to improve the overall quality of the treated effluent to R-1 standards, which would create additional uses for the water on base and further reduce overall water demand at the base.

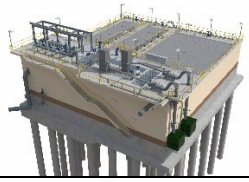
The proposed WRF upgrades include: (1) construction of associated sewage treatment components which would be integrated with and adjacent to the existing WRF systems; (2) redundancy upgrades to existing WRF process units; (3) installation of security fencing; (4) implementation of tsunami design

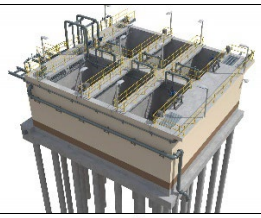
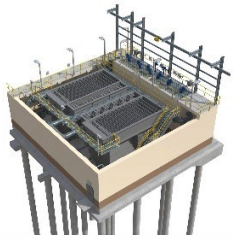
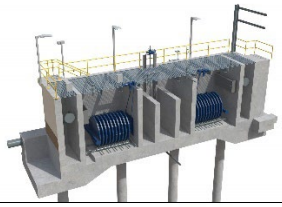
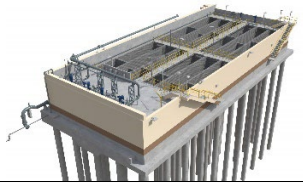
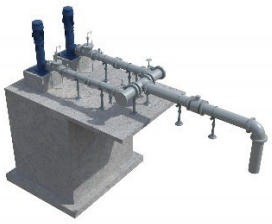
standards for all individual basins, facilities, utilities, and specific elements deemed critical to WRF operations; (5) ability to produce water for reuse; (6) supporting improvements including vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates; (7) installation of a standby generator, bridge crane and SCADA system; and (8) construction laydown locations outside the WRF [enclosure 2].

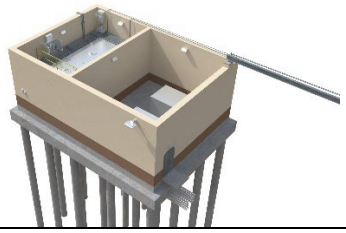
Construction Projects – New Structures: Most of the proposed construction would occur on previously disturbed areas within the existing WRF footprint. The tree planting would occur in undeveloped landscaped area to the east of the WRF [enclosure 4]. No modifications to the ocean outfall would occur. After completion of the project, the upgraded WRF would operate like the existing WRF. Up to ten (10) personnel would be required to operate the upgraded WRF.

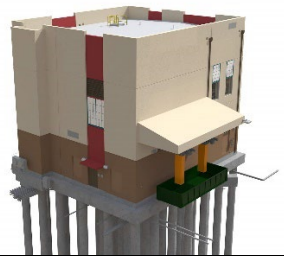
The new construction includes above-grade one and two-story concrete structures on deep piles (approximately 60 feet deep) with mat foundations, using augur-cast piles. Other excavation activities have a maximum depth of 18 feet. Table 1 lists these new structures and process unit upgrades. The new Grit Chamber, Clarifier, Equalization Tank, MBBR, DAF, Filters, Chlorine Contact Basins and Chemical Storage, R-1, and Digester will be designed as hydraulic basins in accordance with ACI 350-06. As stated above, these new structures will have concrete walls supported on mat foundations with deep piles.

Table 1. Proposed New WRF Machinery and Process Upgrades (P-875)

New Construction	Facility Number	Description	Photo
Aerated Grit Chamber	40	Match existing	
Primary Clarifier	41	One 65-foot x 15.5-foot side water depth	
Equalization Basin	42	One 1.18 million gallons	
Odor Control Structure	43	Improve existing	

Moving Bed Biofilm Reactor (MBBR)	51	Two 150,000-gallon trains, three cells each, Blower supporting (3) process air blowers	
Dissolved Air Flotation (DAF)	52	Two 16-foot-wide x 32-foot-long tanks	
Filters	53	Two cloth disk filters	
Blower	54		
Chlorine Contact Basin (Disinfection)	60	Chlorine contact channels, each with volume of 400,000 gallons	
Chemical Storage	61		
Polishing Pond	63		

R-1 Storage Tanks	66	Two 781,000-gallon tanks (each)	
Water Sampling Structure	67		
Operations, Lab, and Electrical Structure	70		
Generator Fuel Tank and Transformers	71		
Anaerobic Digester	81	One 281,000-gallon digester, matching existing	
Dewatering Feed Pumps	81	Two sludge feed pumps to pump sludge from digester Facility 875 to centrifuges. Two centrifuges with sludge conveyor to transfer sludge to holding bin. Polymer storage and metering pump system for sludge conditioning prior to dewatering	

Dewatering Structure	82		
Waste Gas Burner	83		

Built-in equipment: The undertaking also includes installation of a new standby generator, one bridge crane, and a supervisory control and data acquisition (SCADA) system(s) to support the WRF process upgrades.

Electrical/Data/Communications work: The project will install new primary electrical distribution (approximately 1,900 feet long), secondary electrical distribution, transformers, exterior lighting, and new data/communications lines (approximately1,200 feet long) and connections as shown on enclosure 4. The trenching will require a maximum depth of 18 feet.

Mechanical utilities: The project will install new mechanical utilities consisting of a sanitary sewer system, potable water distribution, fire and water distribution system, and storm water drainage. Other new mechanical utilities include process pipes, R1 pipes and pumps to convey treated wastewater and reuse water; interconnecting process, process air, and chemical feed piping; and gravity and pressure pipelines. The demolition and excavation work associated with mechanical utilities work will be located within the WRF project area. The excavation work associated with the mechanical utilities will have a maximum depth of 18 feet.

Site preparation and landscape area: The undertaking will carry out site clearing and grubbing work, earthwork, grading, dewatering, paving roadways, and landscaping. Existing roads would be gravel pavement and new roads would be asphalt pavement. Storm drainage, new catch basins, and curb inlets would drain to a new pipe system. The project will also plant new trees in a landscape area east of the WRF as shown on enclosure 4. The site preparation and landscaping work will have a maximum depth of 18 feet.

Fencing and Gates: The project would install perimeter fencing with clear zones of 10 feet minimum exterior and 20 feet minimum interior. The perimeter fence along the existing west side would remain and the project would not disturb the existing vegetation on this side. The proposed WRF perimeter fence consists of an 8-foot tall fence with 7-foot tall chain link and 1-foot single outrigger with barbed wire.

Parking: Three new parking spaces and two parallel parking spaces would be installed.

Demolition: Proposed demolition of existing mechanical structures would include the Laboratory and Office Facility 892, Digester 902, Fuel Tank 898, Sludge Beds 893 and 899, Compressor 5091, and Generator 6850. A list of the existing WRF mechanical structures, including those to be demolished, is provided in Table 2 below, along with the installation date, type and function, eligibility for the National Register (NR), proposed impact by the project, and location within the WRF. Ground disturbing activities associated with the demolition of this machinery may extend to a maximum depth of 6 feet.

Construction laydown areas: The project requires temporary contractor laydown areas for contractor parking, construction fencing, heavy equipment parking, temporary office trailer with temporary utilities, and fuel storage as shown on enclosure 4. At the end of the construction, the laydown area will be restored to existing or better condition by the contractor.

AREA OF POTENTIAL EFFECT

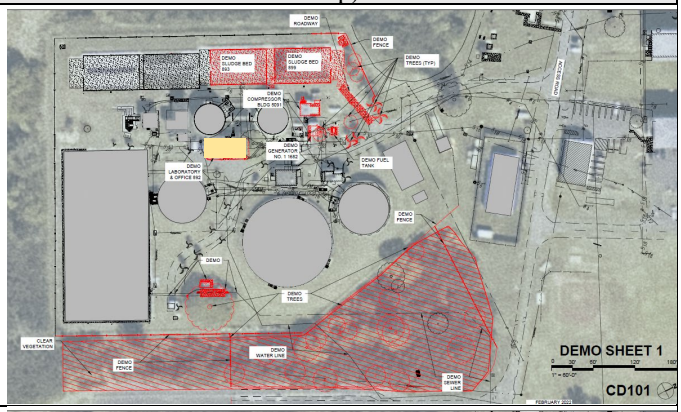
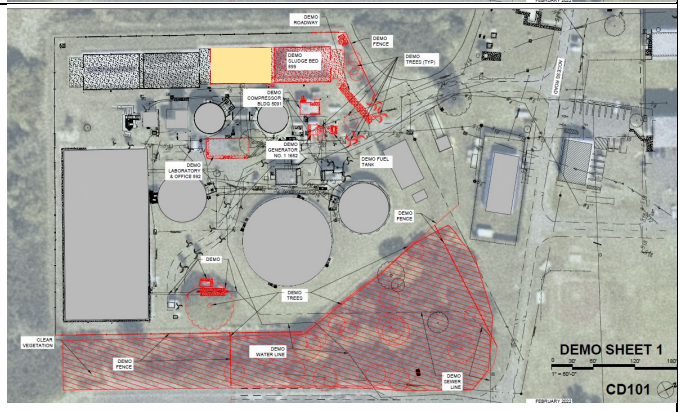
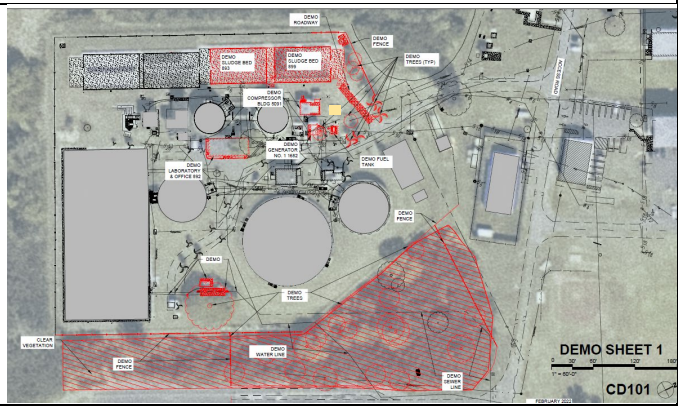
The area of potential effects (APE) has been determined to include the footprint of the P-875 WRF Redundancy project as shown on enclosure 4, including temporary contractor laydown areas, electrical/data/communication work, and landscape area designated for tree planting east of the WRF.

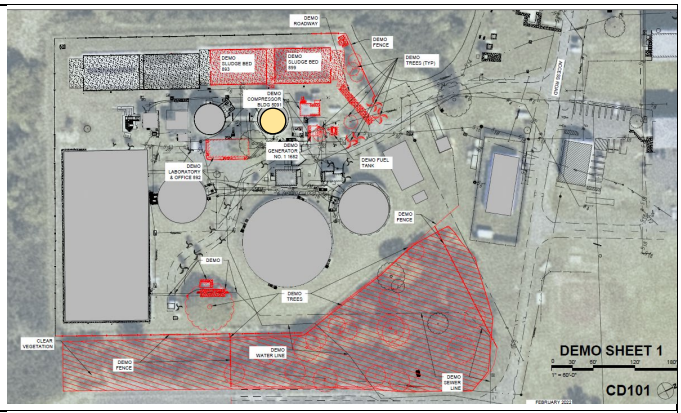
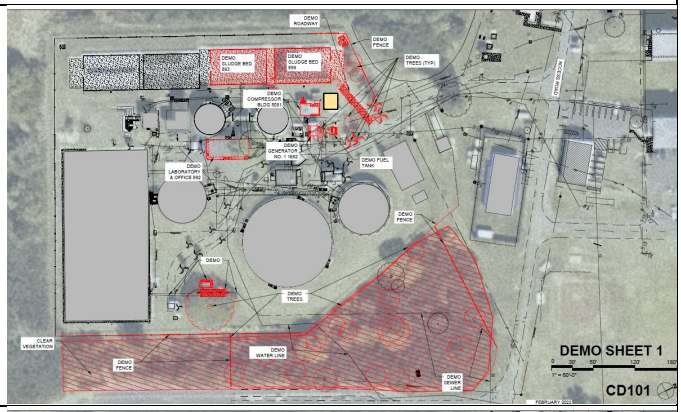
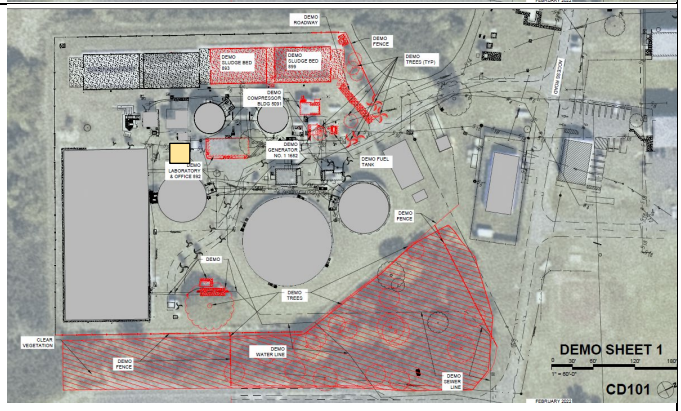
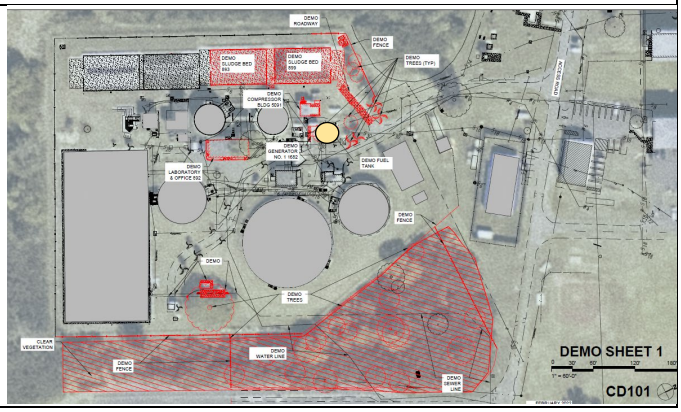
IDENTIFICATION OF HISTORIC PROPERTIES

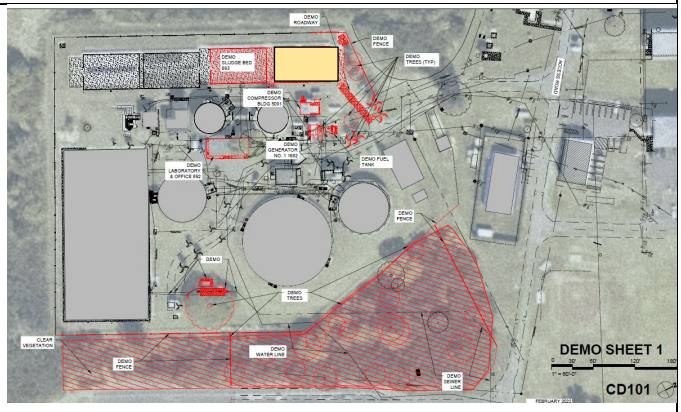
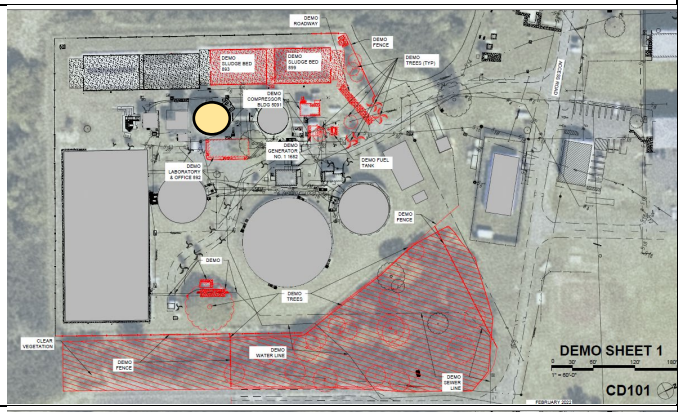
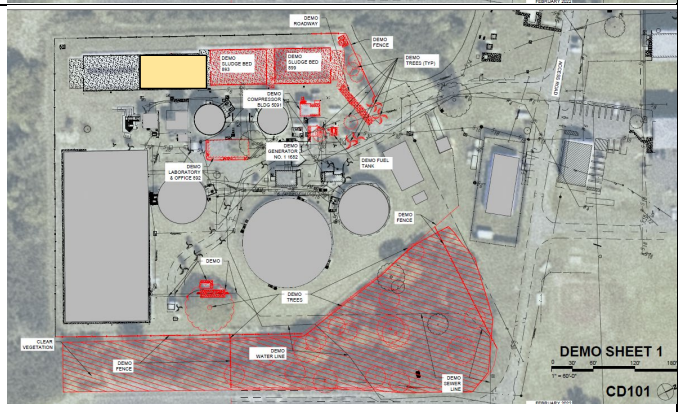
There are no historic properties, including districts, structures, buildings, objects, sites, and/or subsurface archaeological deposits, in the project APE. Table 2 below lists existing mechanical units at the WRF, including the installation date, type and function, NR-eligibility, project impact, and location within the WRF site. Some of these were included in the Wil Chee - Planning et al. 2014 "Historic Context and Building Inventory, Marine Corps Base Hawaii," which assessed structures built during the "Cold War" period from 1946 to 1992. The 2014 study includes concurrence on eligibility from the State Historic Preservation Officer (SHPD) as Appendix F. This study did not assess select WRF systems, pipes, valves, beds, devices, and tanks because they were machines, not buildings. These are identified with an asterisk in Table 2 and include an assessment of NR-eligibility based on the National Park Service (NPS) "National Register Bulletin No.15: How to Apply the National Register Criteria for Evaluation," and the NPS Best Practices Review, Issue 4, July 2023, "Evaluating Common Resources," which includes the following guidance on structures:

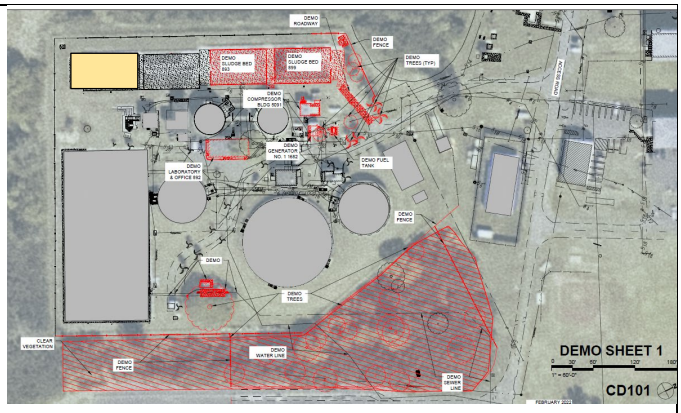
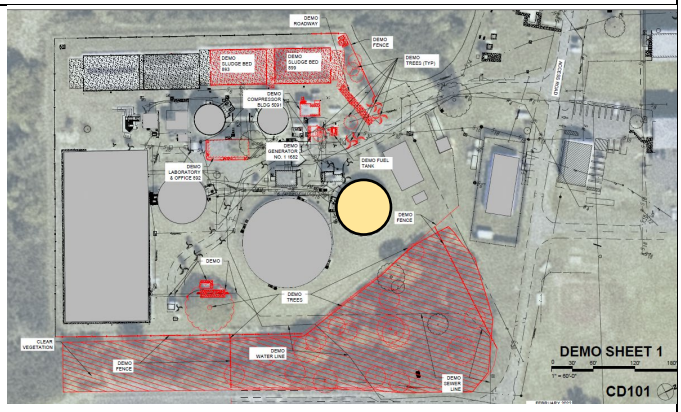
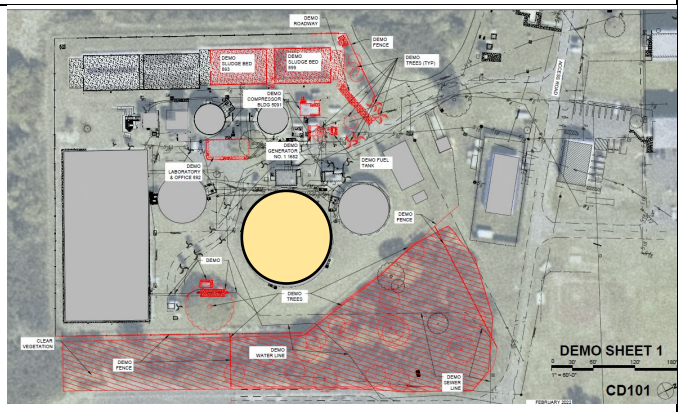
> A structure is eligible as a specimen of its type or period of construction if it is an *important* example (within its context) of building practices of a particular time in history. For properties that represent the variation, evolution, or transition of construction types, it must be demonstrated that the variation, etc., was an *important* phase of the architectural development of the area or community in that it had an impact as evidenced by later buildings ("Distinctive Characteristics of Type, Period and Method of Construction," p. 18, emphasis added.)

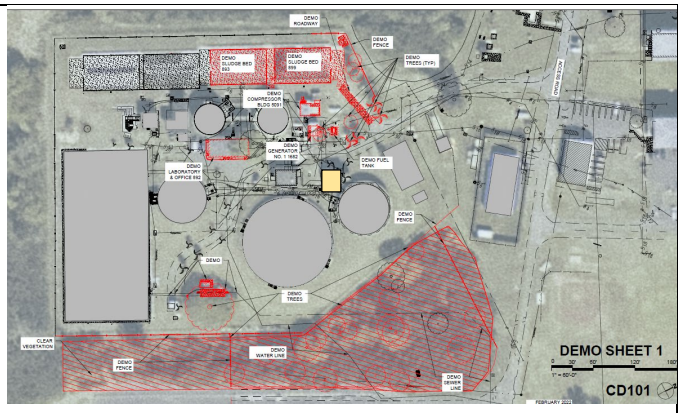
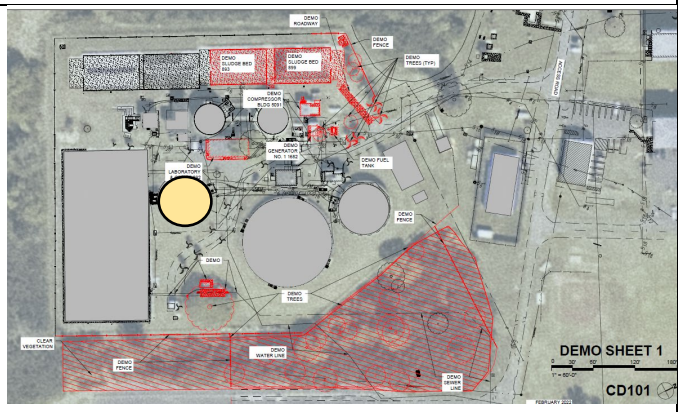
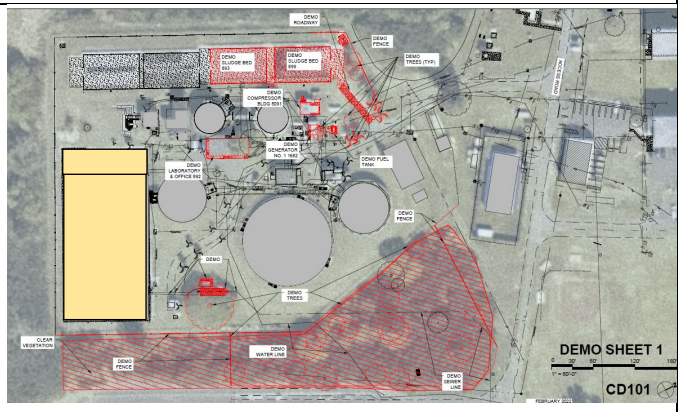
Table 2. Existing WRF Structures (limits of demolition shown in red)

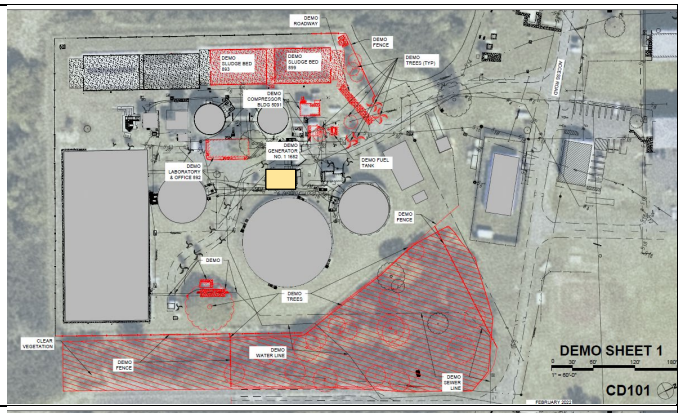
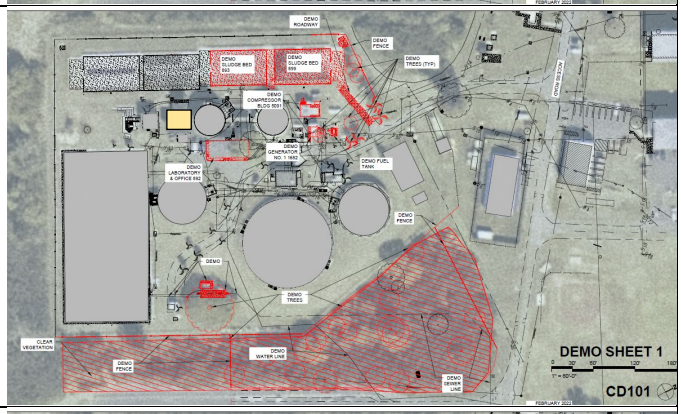
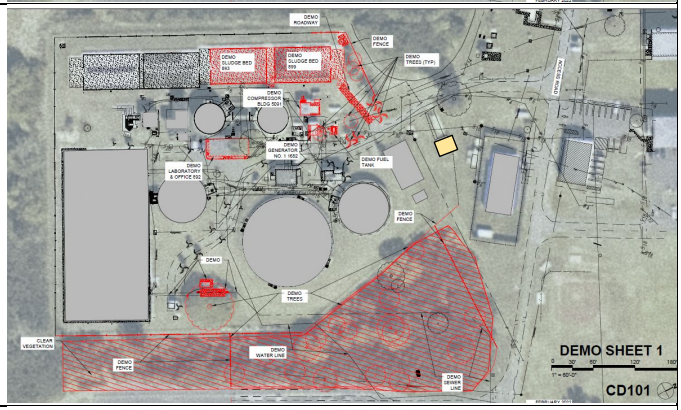
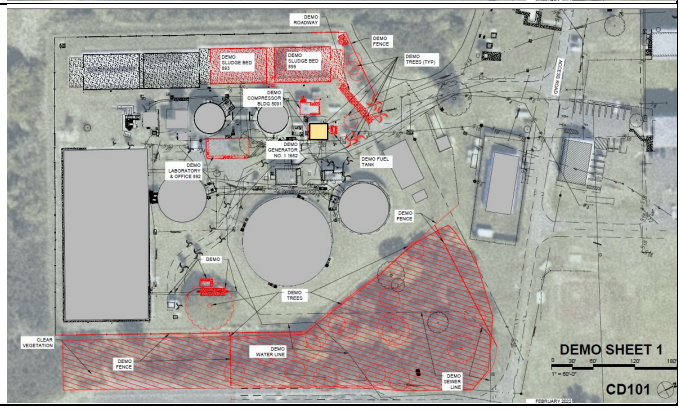
Facility No. (in yellow)	Type and Function	Build Date; NR-eligibility	Project Impact	Location (WRF west side is top of map; WRF south side is left side of map; WRF north side is right side of map; and WRF east side is bottom of map)
892	Laboratory & Office	1947; NE (Wil Chee et al.2014)	Demolish	
893	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Demolish	
894	Sewage Treatment Comminuter (Headworks) Comminuters are grinders used for raw sewage solids in plant headworks and pump stations.	1947; NE*	Retain	

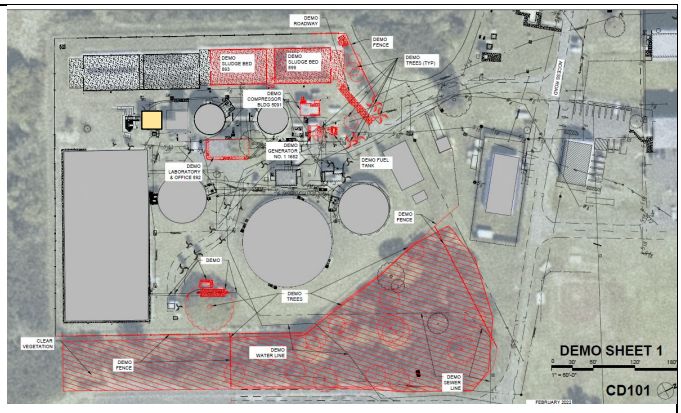
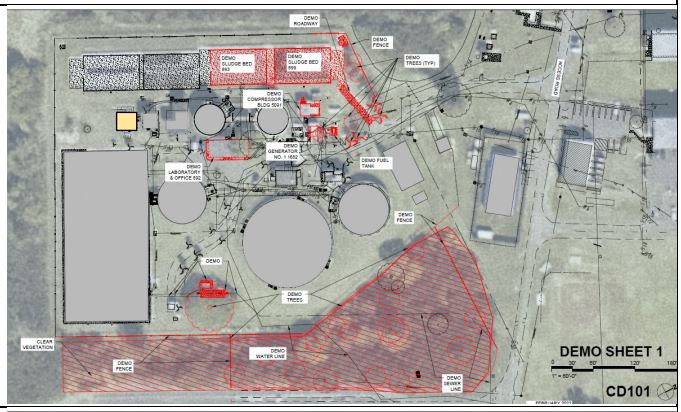
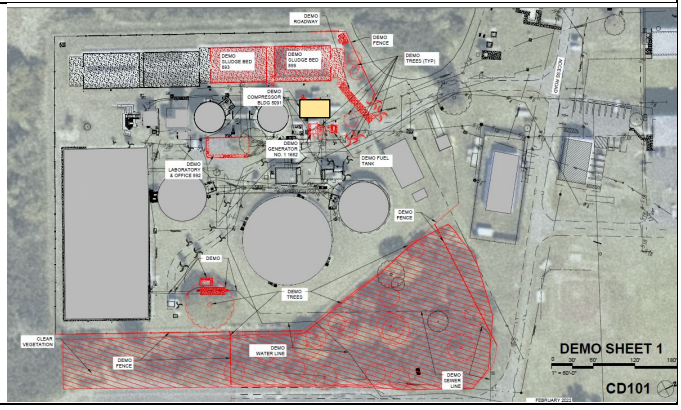
895	Secondary Digester Tank Digesters are systems (lagoons or tanks) used for recycling waste at different temperature ranges.	1947; NE*	Retain	
896	Paint Storage Structure for paint storage.	1947; NE (Wil Chee et al. 2014)	Retain	
897	Sewage Treatment Chlorinators Chlorinators are systems used for disinfection and one of the primary mechanisms for destruction of pathogenic organisms.	1947; NE*	Retain	
898	Fuel Tank Industrial fuel storage tanks are standards certified containers, which provide safe storage of chemicals, solvents, oil, petro, diesel, and other	1979; NE*	Demolish	

	flammable liquids.			
899	Sewage Treatment Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Demolish	
902	Digester No. 2 Digesters are systems (lagoons or tanks) used for recycling waste at different temperature ranges.	1952; NE*	Demolish	
977	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Retain	

978	Sludge Bed Sludge-drying beds are the simplest method of dewatering. Digested sludge slurry is spread on open bed of sand. Piping under sand helps evaporation and collects water.	1947; NE*	Retain	
1376	Primary Clarifier Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation.	1972; NE*	Retain	
1377	Trickling Filter This is a type of wastewater treatment system consisting of a fixed bed of rocks, coke, gravel, slag, polyurethane foam or other media over which sewage flows downward and causes a layer of microbial slime (biofilm) to grow.	1972; NE*	Retain	

1378	Aerated Grit Chamber Form of grit chamber consisting of a standard spiral flow aeration tank with air diffusion tubes at one end of tank about .6 to 1 meter from bottom.	1972; NE*	Retain	
1379	Final Clarifier Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. The final or secondary clarifier is one of the unit processes that determines the capacity of the low effluent suspended solids levels.	1972; NE*	Retain	
1380	Polishing Pond and Chlorine Contact Basin. Polishing ponds are facultative lagoons providing a type of waste stabilization pond for tertiary treatment of wastewater.	1972; NE*	Retain	

1403	Lift Station A wastewater lift station is a pump system that removes wastewater from a lower elevation to a higher elevation.	1973; NE*	Retain	
1413	Chlorine Storage Structure for chlorine storage.	1972; NE (Wil Chee et al. 2014)	Retain	
1622	General Storage Shed	1979; NE (Wil Chee et al. 2014)	Retain	
1682	Emergency Generator Device for generating electricity that is used in the even of a failure of the regular power supply.	1976; NE*	Demolish	

1683	Effluent Pump Control and Generator No.2 Effluent or dewatering pumps are used in septic tanks, low pressure pipes, and other treatment processes to pump effluent or wastewater.	1976; NE*	Retain	
1684	Sewage Pump Devices that automatically pump sewage without needing manual intervention.	1976; NE*	Retain	
5091	Compressor. Mechanical device that increases the pressure of gas by reducing its volume.	1989; NE*	Demolish	

In addition, there are no National Register (NR)-eligible archaeological deposits or sites. The WRF was built entirely on man-made filled lands that could not, therefore, contain any subsurface deposits or sites [enclosure 5]. Previous archaeological investigations (Fong 2013; Sasaki and Filimoehala 2021; Vernon and Gosser 2021) confirm that the WRF project area is composed largely of man-made fill covered by a deep layer of modern fill material [enclosure 6].

In the area north of the WRF site in the area proposed for trenching for new Duct Banks, the ground is also composed largely of filled lands. Previous archaeological studies overlapping this area (Asbury-Smith and Dega 2002; Eakin 2012; Fong 2013; Schilz et al. 1996b; Schilz et al. 1997; Sholin and Dye

2011; Wulzen and Haun 1996) confirm this area is largely composed of man-made fill. These studies recorded no evidence of subsurface archaeological deposits or sites. In the portion of the project proposed for trenching for new duct banks, Jimenez et al. (1998) found only shoreline deposits with thin or nonexistent terrigenous deposits and layers of clay and sand deposits representing bay/lagoonal environments from 1928 (1998:18, 23). This study concluded that "There is no potential for encountering intact cultural deposits in trenches excavated in the pre-1928 offshore areas. The deposits in this zone consist of landfill on top of bay/lagoonal deposits of clay, sand and coral" (Jimenez et al. 1998:31).

Table 3 below provides a list of previous archaeological investigations in or near the project APE, which includes citation, title of report, type of investigation, and location of any findings within the APE. See enclosure 6 for the location of each study in relation to the APE.

Table 3. Previous Archaeological Investigations in the Project APE

Citation	Report	Type of Investigation	Findings within APE
Asbury-Smith and Dega 2002	Removal of Underground Storage Tanks and Oil/Water Separators	Archaeological monitoring and sampling	None
Charvet-Pond and Rosendahl 1992f	Archaeological Monitoring Southwest Periphery of Nuupia Pond and Lawrence Road, Third Street, and Selden Street	Archaeological monitoring	None
Eakin 2012	Third Street Repairs	Archaeological monitoring	None
Fong 2013	Archaeological Monitoring Report In Support of the Repairs and Upgrades for the Water Reclamation Facility	Archaeological monitoring	None
Jimenez et al. 1998	Repairs to Sanitary Sewer System	Archaeological monitoring	None
Jordan and Reith 2011	Water Line Replacement, Water Lines H10707M and H10709M	Archaeological monitoring	None
Prishmont et al. 2001	Base Realignment and Closure (BRAC) Program	Archaeological monitoring	None
Roberts et al. 2002	Outside Cable Rehabilitation (OSCAR) Project	Archaeological monitoring	None
Sasaki, Jennifer and Darby Filimoehala 2021	Draft Archaeological Monitoring Report in Support of Wastewater Reclamation Facility Electrical Distribution System Project	Archaeological monitoring	None

Vernon and Gosser 2021	Archaeological Monitoring Report in Support of Construction to Replace B902, Primary Digester [WRF]	Archaeological monitoring	None
Wulzen and Haun 1996	Trenching for Water Pipe in Support of Project KB9562RS and Fence Post Excavation for Expansion of the Canine Obstacle Course Buildings 1095 and 1096	Archaeological monitoring	None

BEST MANAGEMENT PRACTICE

Altough there is no potential for encountering NR-eligible subsurface deposits or sites, all ground disturbing activities associated with the P-875 WRF Redundancy project shall be monitored by a qualified archaeologist as a best management practice due to the potential for dissociated cultural material, including human remains, to be present in dune sand used as construction material during initial base construction at MCBH Kaneohe Bay. 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, and the items will be secured and protected. Treatment shall proceed under the authority of NAGPRA.

DETERMINATION OF EFFECT

MCBH has determined that the proposed P-875 WRF Redundancy Construction and Upgrades project will result in no historic properties affected in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) there are no known historic properties in the APE; 2) the mechanical units more than 50 years old and not included in the 2014 Wil Chee et al. "Historic Context and Building Inventory" are not National Register (NR)-eligible specimens of a type or period of construction that are important examples (within this context) of building practices of a particular time in history and do not represent variation, evolution, or transition of construction types that were an important phase of the architectural development of the area or community (NPS Best Practices Review, Issue 4, July 2023, "Evaluating Common Resources, p.18;" and 3) previous archaeological investigation have shown that there is no potential to encounter subsurface NR-eligible deposits or sites in areas of ground disturbance because the ground is composed of man-made filled lands and modern fill material.

We request your review of and concurrence of the above determinations within 30 days of receipt of this letter. As defined in 300 CFR 800.4(d)(1)(i) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. MCBH is also forwarding a copy of this letter to the additional consulting parties listed below as part of the Section 106 consultation process for this proposed undertaking. Therefore, we request review and comments from these consulting parties regarding the above determinations within 30 days of receipt of this letter.

5090
LFE/144-23

Should you or your staff have any questions or concerns please contact the MCBH Cultural Resources Management staff, Ms. June Cleghorn via email at june.cleghorn@usmc.mil, Ms. Jessica Leger via email at jessica.leger@usmc.mil, or Dr. Wendy Wichman via email at wendy.j.wichman.ctr@usmc.mil.

Sincerely,

HART.JEFFRY.P.1242350568 Digitally signed by HART.JEFFRY.P.1242350568 Date: 2024.11.26 12:19:21 -10'00'

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

Enclosure:
1. Location of the P-875 WRF Redundancy project.
2. Rendering of the proposed P-875 WRF Redundancy project including existing and new facilities and processes. Note: Table 1 lists the proposed new structures; and Table 2 lists existing structures, including those proposed for demolition.
3. Figure showing location of the existing infrastructure, new construction, roads and fencing.
4. Drawing showing the project APE, including existing WRF; contractor lay down areas (no ground disturbance); new duct banks for electrical/data/communication work in blue area that requires trenching; electrical/data/communication work in green area that requires no ground disturbance; and landscape area east of the WRF designated for tree planting.
5. Location of WRF within an area of man-made filled land based on the Geologic Map used for a previous archaeological study at the WRF (Vernon and Gosser 2021:Fig.2). Note: There is no potential for archaeological resources to be present within this area of man-made filled land.
6. Location of previous archaeological investigations in relation to the WRF project (Vernon and Gosser 2021:Fig.6).

Copy to:
Ms. Anuhea Diamond, Kaulamealani Diamond; Diamond ʻOhana
Ms. Skye Razon-Olds, Kulamanu Napoleon, Kaleleonalani Napoleon; Olds ʻOhana
Ms. Emalia Keohokalole, Keohokalole ʻOhana
Ms. Nau Kamali`i; Boyd ʻOhana
Ms. Donna Ann Camvel; Paoa Kea Lono ʻOhana
Mr. Cy Harris; Kekumano ʻOhana
Ms. Terrilee Napua Kekoolani Raymond; Kekoolani ʻOhana
Ms. Cathleen Mattoon; Koolauloa Hawaiian Civic Club
Mr. Clive Cabral; Temple of Lono
Chair; Office of Hawaiian Affairs
Chair; Oahu Island Burial Council
Ms. Kiersten Faulkner, Historic Hawaii Foundation
Ms. Elizabeth Merritt, National Trust for Historic Preservation

References:

Asbury-Smith, Pamela, and Michael Dega
2002 Archaeological Monitoring and Sampling During Removal of Underground Storage Tanks and Oil/Water Separators at U.S. Marine Corps Base Hawaii, Kane‘ohe Bay, O‘ahu Island, Hawai‘i. Prepared for U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Scientific Consultant Services, Honolulu.

Charvet-Pond, Ann, and Paul H. Rosendahl
1992f Archaeological Monitoring Southwest Periphery of Nuupia Pond and Lawrence Road, Third Street, and Selden Street, Marine Corps Air Station, Kaneohe Bay, TMK 4:4:08. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hilo.

Eakin, Joanne
2012 Archaeological Monitoring in Support of Third Street Road Repairs, Marine Corps Base (MCB) Hawaii, Kāne‘ohe Bay, Kāne‘ohe Ahupua‘a, Ko‘olaupoko District, O‘ahu, Hawai‘i. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Southeastern Archaeological Research, Inc., Honolulu.

Fong, Jeffrey W. K.
2013 FINAL - Archaeological Monitoring Report In Support of the Repairs and Upgrades for the Water Reclamation Facility at Marine Corps Base (MCB) Hawaii, Kaneohe Bay, Kāne‘ohe Ahupua‘a, Ko‘olaupoko District, O‘ahu, Hawai‘I, TMK: (1) 4-4-008: 005 & 00. Prepared for Marine Corps Base Hawaii, Environmental Protection and Compliance Department, MCBH, Kaneohe Bay, Hawaii. Department of the Navy, Naval Facilities Engineering Command, Pacific, August 2013.

Jimenez, Joseph A., Thomas R. Wolforth, Robert B. Rechtman, and Alan E. Haun
1998 Archaeological Monitoring of Trench Excavations for Phase II (KB356MS) Repairs to Sanitary Sewer System, Marine Corps Base Hawaii Kaneohe Bay, O‘ahu. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Paul H. Rosendahl, Ph.D., Inc., Hawai‘i Island, Hawai‘i.

Jordan, Nichole, and Timothy Rieth
2011 Archaeological Monitoring in Support of Water Line Replacement, Water Lines H10707M and H10709M, Marine Corps Base Hawaii, Kane‘ohe, O‘ahu, Hawai‘i. Prepared for Naval Facilities Engineering Command, Pacific Division. International Archaeological Research Institute, Inc., Honolulu.

Prishmont, Laura Ann, Jane Allen, and Stephan D. Clark
2001 Archaeological Monitoring in Support of the Base Realignment and Closure (BRAC) Program Relocating Barbers Point Naval Air Station Operations to Marine Corps Base Hawaii Kaneohe Bay, O‘ahu Island, Hawai‘i. Prepared for U.S. Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Roberts, Alice K. S., Katharine S. Brown, and Eric W. West
2002 Archaeological Monitoring and Sampling for Outside Cable Rehabilitation (OSCAR) Project, Marine Corps Base Hawaii (MCBH-KB), Kaneohe Bay, Ko‘olaupoko District, Island of O‘ahu, Hawai‘i. U.S. Army Corps of Engineers, Honolulu District, Fort Shafter. Garcia and Associates, Kailua, O‘ahu.

Sasaki, Jennifer and Darby Filimoehala
2021 Draft Archaeological Monitoring Report in Support of Wastewater Reclamation Facility Electrical Distribution System Project, Marine Corps Base Hawaii, Kaneohe Bay, Hawaii. Prepared for SU-MO Builders, Inc., Honolulu, Hawaii. International Archaeology, LLC. October 2021.

Schilz, Allan J., and Jane Allen
1996 Archaeological Monitoring and Data Recovery for Negation of Adverse Effect of KB-038M. Replace Potable Water Mains, and Site 50-80-11-4933, Marine Corps Base Hawaii Kaneohe Bay, Oʻahu, Hawaiʻi. Prepared for U.S. Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Schilz, Allan J., James Landrum, and Jane Allen
1996 Archaeological Monitoring for Negation of Adverse Effect of KB975MS Repair of Effluent Irrigation System ("Reef") Marine Corps Base Hawaii. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Ogden Environmental and Energy Services Co., Inc., Honolulu.

1997 Archaeological Monitoring of KB-163MS, Repairs to Sanitary Sewer System (RESEW) at Marine Corps Base Hawaii Kaneohe Bay. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Sholin, Carl E. and Thomas S. Dye
2011 Archaeological Monitoring Report in Support of Effluent Waterline Replacement at Marine Corps Base (MCB) Hawaii's Water Reclamation Facility. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command. T.S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

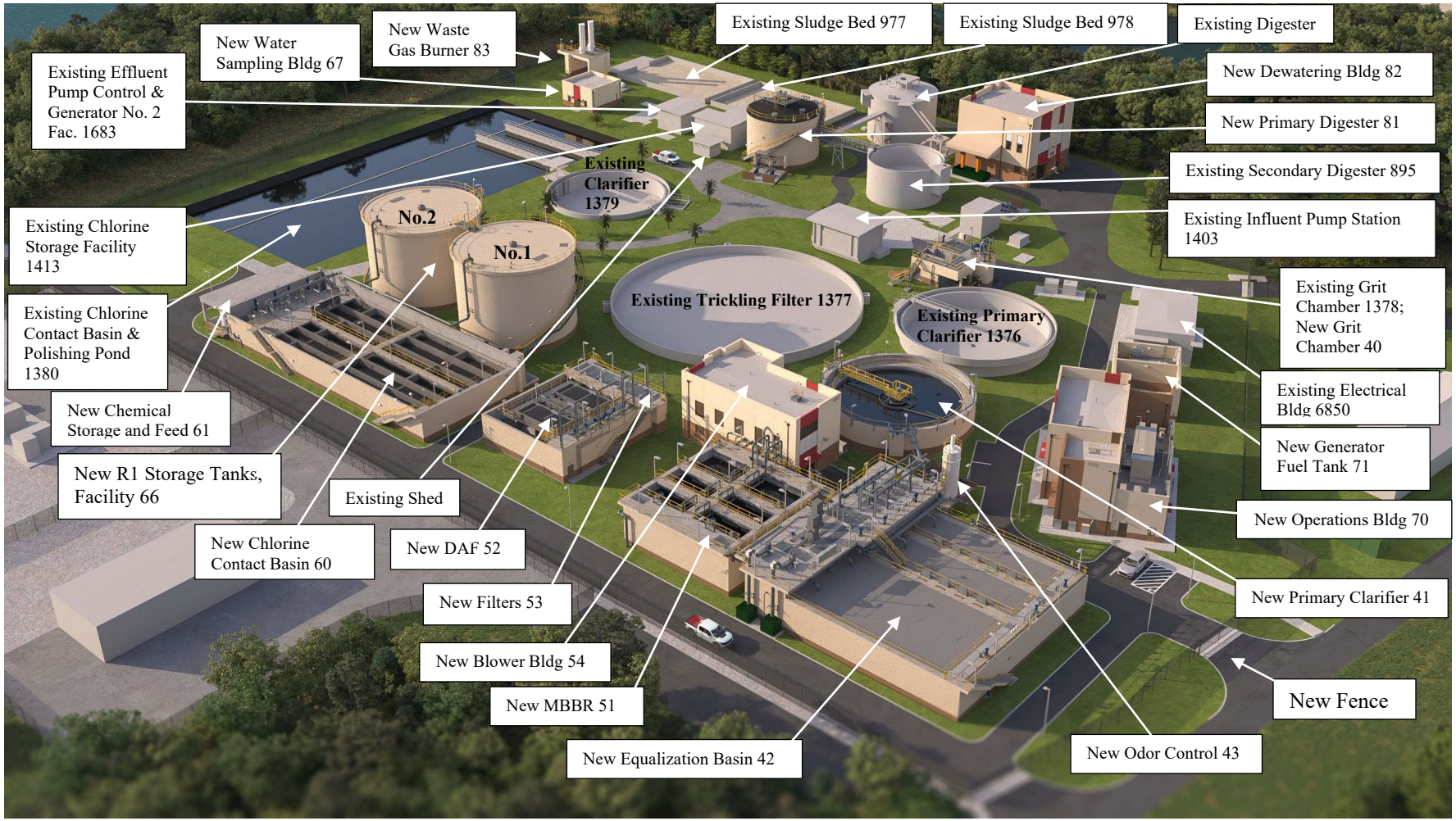
Tomonari-Tuggle, M.J., and Jessica L. Clark
2021 Update to the Integrated Cultural Resources Management Plan (ICRMP), Marine Corps Base Hawaii, 2021-2026. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii.

Vernon, Nicole I. and Dennis C. Gosser
2021 Archaeological Monitoring Report in Support of Construction to Replace B902, Primary Digester, Marine Corps Base Hawaii, Kaneohe Bay, Oahu, Hawaii. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Pacific Consulting Services, Inc., 2021.

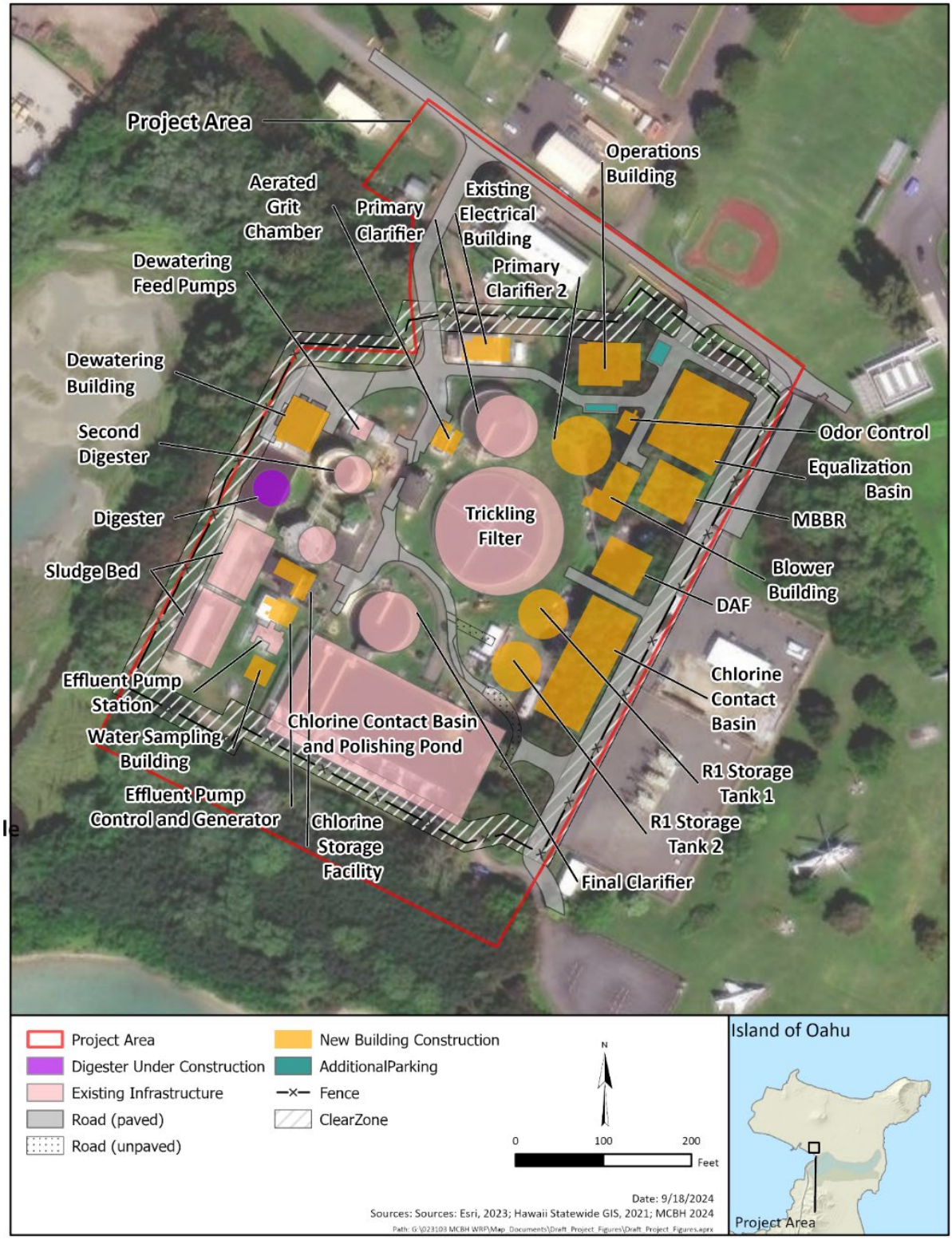
Wil Chee Planning et al.
2014 Historic Context and Building Inventory, Marine Corps Base Hawaii." Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii. Wil Chee – Planning, Inc. Helber, Hastert, & Fee, Planners. Mason Architects, Inc. May 2014.

Wulzen, Warren and Alan Haun
1996 Archeological Monitoring of Trenching for Water Pipe in Support of Project KB9562RS and Fence Post Excavation for Expansion of the Canine Obstacle Course Buildings 1095 and 1096, Marine Corps Base Hawaii, Kaneohe Bay. Prepared for Department of the Navy, Naval Facilities Engineering Command, Pacific Division. Paul H. Rosendahl, Ph.D., Inc., Hilo

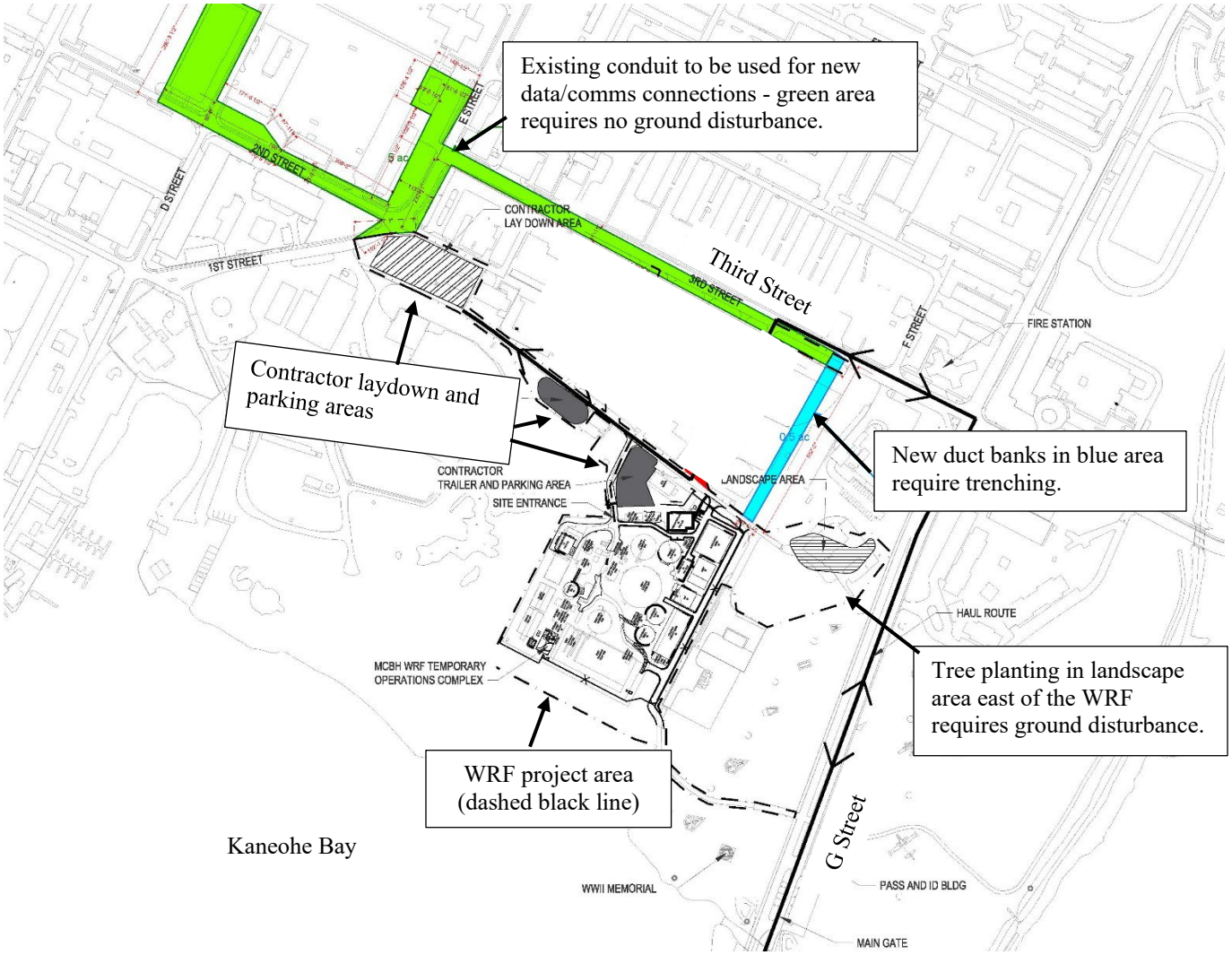
Enclosure 1. Location of the P-875 WRF Redundancy project at MCBH Kaneohe Bay.



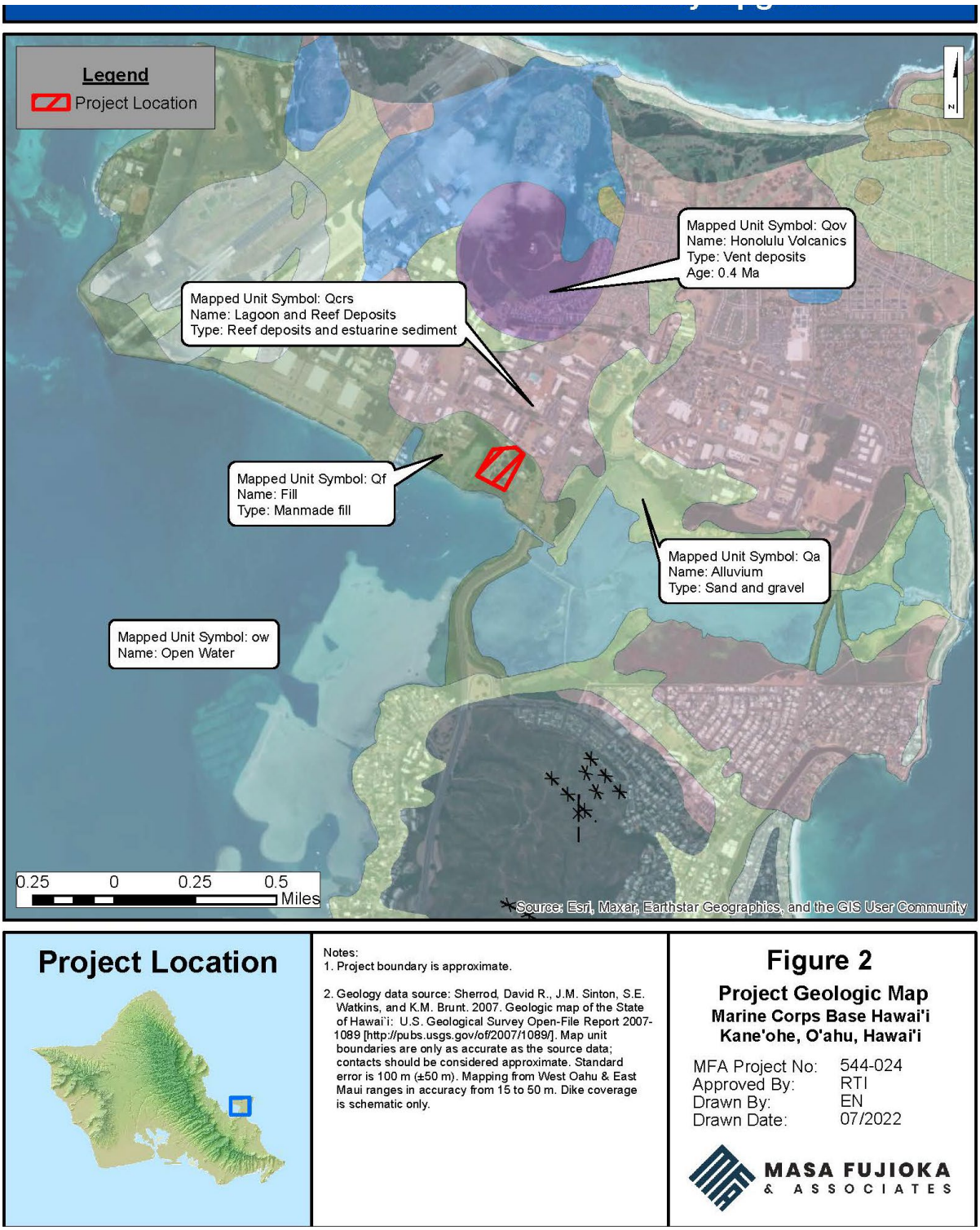
Enclosure 2. Rendering of the completed P-875 WRF Redundancy Upgrade project including new and upgraded structures and unit processes. Note: Table 1 describes the function of the new units; and Table 2 describes existing facilities including those proposed for upgrades or demolition.



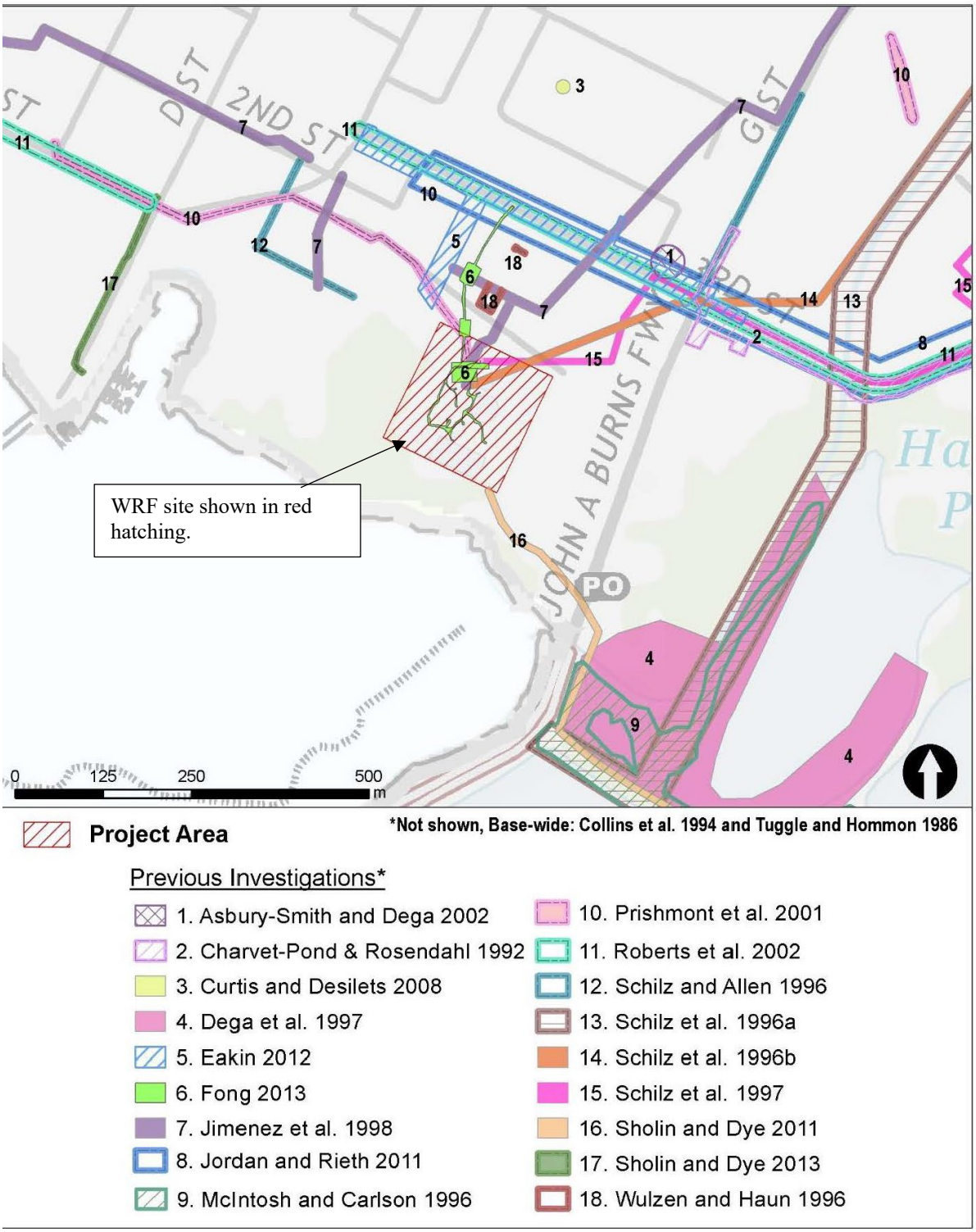
Enclosure 3. Figure showing existing infrastructure (pink), new construction (orange), roads, parking, and fencing.



Enclosure 4. Drawing showing the project APE, including existing WRF; contractor lay down areas (no ground disturbance); new duct banks for electrical/data/communication work in blue area that requires trenching; electrical/data/communication work in green area that requires no ground disturbance; and landscape area east of the WRF designated for tree planting.



Enclosure 5: Location of the WRF project area (outlined in red) within the man-made filled land (shown in green) where there is no potential for archaeological resources to be present. Note: Map was based on the Geologic Map that was used for a previous archaeological study at the WRF (Vernon and Gosser 2021:Fig.2).



Enclosure 6: Previous archaeological investigations in relation to the WRF are shown in red hatching (Vernon and Gosser 2021:Fig.6).

Appendix D
ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

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Biological Opinion for the Marine Corps Base Hawai‘i Wastewater Reclamation Facility (WRF) Upgrade Kāne‘ohe Bay, Hawai‘i

Photo credits: *Himantopus mexicanus knudseni* by Dan Clark USFWS

March 28, 2025
(2025-0014888-S7)

United States Department of the Interior

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

In Reply Refer To:
2025-0014888- S7

March 28, 2025

Major Jeffry Hart
Environmental Compliance and Protection Director
Marine Corps Base Hawai'i
Box 63002
Kāne'ohe Bay, Hawai'i 96863-3002

Subject: Biological Opinion for the Marine Corps Base Hawai'i Wastewater Reclamation Facility (WRF) Upgrade Kāne'ohe Bay, Hawai'i

Dear Major Hart:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Wastewater Reclamation Facility (WRF) Upgrade at Marine Corps Base Hawai'i (MCBH), O'ahu, and its effects on the endangered Hawaiian stilt or ae'o (*Himantopus mexicanus knudseni*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.).

This biological opinion is based on the information you provided in your October 8, 2024, request for formal consultation, the corresponding *Biological Assessment for the MCBH WRF Upgrade Kāne'ohe Bay, Hawai'i*, information provided in email correspondence between the Service and MCBH staff from December 9, 2024 to February 11, 2025, field investigations, and other sources of information. A complete administrative record of this consultation is on file at our Pacific Islands Fish and Wildlife Office in Honolulu, Hawai'i.

Additionally, MCBH's biological assessment included a request for Service concurrence with your determination that the proposed action "may affect, but is not likely to adversely affect" the endangered Hawaiian hoary bat or 'ōpe'ape'a (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel or 'ua'u (*Pterodroma sandwichensis*), the threatened Newell's Townsend's shearwater or 'a'o (*Puffinus auricularis newelli*), and the endangered Hawai'i distinct population segment (DPS) of band-rumped storm petrel or 'akē'akē (*Hydrobates castro*). Please see Appendix A for our concurrence on those species.

CONSULTATION HISTORY

October 28, 2024: The Service emailed MCBH requesting additional clarification on the proposed conservation measures provided.

November 4, 2024: The Service sent a letter of initiation of formal consultation to MCBH via email correspondence.

November 19, 2024: MCBH notified Service staff of an incident involving five ae‘o found deceased in the secondary clarifier via email correspondence.

November 19, 2024: Email and phone correspondence occurred between Service and MCBH staff regarding conservation measures to address impacts from the secondary clarifier.

December 9, 2024: Via email correspondence, MCBH submitted all information requested and confirmed the recommended conservation measures provided by the Service would be incorporated into the project activities.

December 12, 2024: The Service and MCBH agreed via email correspondence, to a 42-day extension on the timeline of the biological opinion to ensure all new and pertinent information provided would be appropriately incorporated.

February 11, 2025: Via phone call and email correspondence, MCBH provided the Service with a change in construction activities involving the length of the proposed barbed wire fencing.

March 11, 2025: The Service submitted adjusted language on the proposed hazing measures to MCBH via email correspondence.

March 12, 2025: MCBH confirmed the adjusted language for the proposed hazing measures via email correspondence with the Service.

BIOLOGICAL OPINION

Project Description

Description of Proposed Action

The proposed action is to construct and operate a redundant wastewater treatment system, ensuring that treated effluent continues to meet existing permit limitations during planned maintenance events. In order for MCBH to reach compliance standards with its Hawai‘i State Department of Health (DOH) discharge permit #HI0110078, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The purpose of the proposed action is to eliminate the need for planned maintenance events, meet water quality and disinfection permit standards, provide new water reuse capabilities on base, and meet tsunami design standards. The facility would also include increased fencing, consisting of an 8-

foot-tall fence, limited to approximately 2,100 linear feet of 3-strand barbed wire. Furthermore, the proposed action would allow the WRF to maintain full capacity during maintenance activities. The proposed action would occur at the existing WRF entirely within MCBH. No construction work would take place within the neighboring Salvage Yard wetland to the west. The construction aspect of the project will occur over a 3-year period from Fiscal Year 2025 through Fiscal Year 2028. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF. See Figure 1.

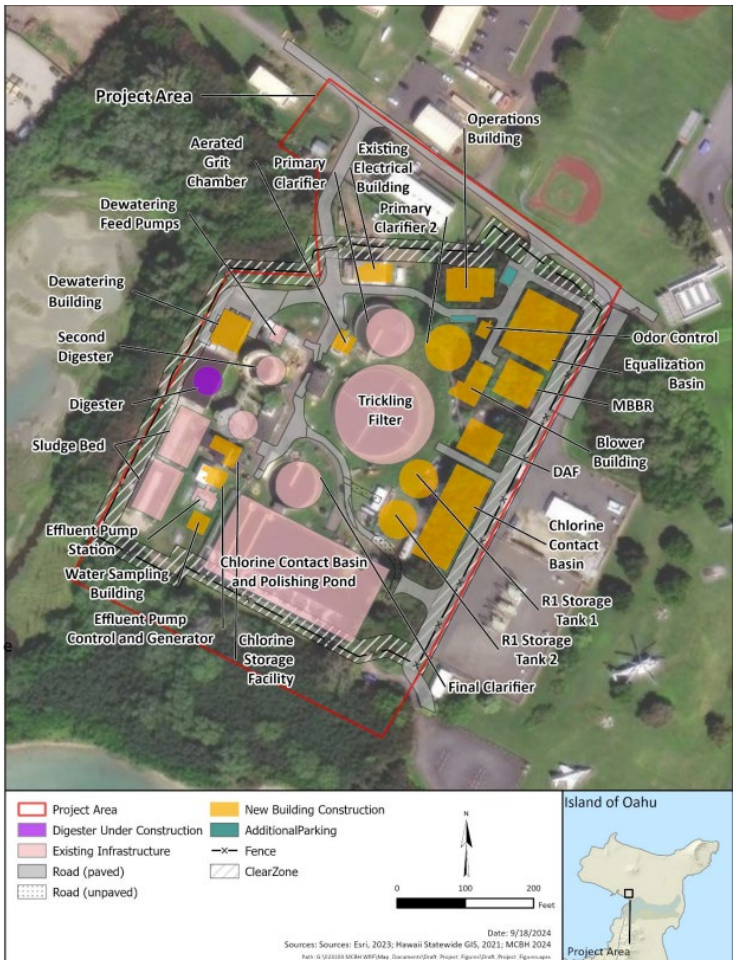

Figure 1. Proposed Water Reclamation Facility Upgrade

The proposed WRF upgrade includes:

- Construction of associated sewage treatment facilities
- Installation of security fencing
- Redundancy upgrade
- Tsunami Designs
- Ability to produce water for reuse

- Supporting improvements to include vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates
- Construction laydown locations outside the WRF
- Operations of the upgraded facilities after construction is completed

Most of the proposed construction would occur on previously disturbed areas within the existing WRF footprint. Proposed construction would occur in undeveloped landscapes. No modifications to the marine outfall would occur under the proposed action, and there would be no change in total discharge quantities.

The upgraded WRF would improve water treatment from the current level (secondary treatment) to tertiary treatment through the addition of equipment and processes such as filtration and dichlorination. In addition, it would provide full redundancy and integration enabling future maintenance, repairs, and replacements to occur while continuing to meet treated effluent standards. The treated effluent would continue to be discharged to the outfall in Kāneʻohe Bay in the same manner as currently done. In addition, the upgraded WRF would be capable of improving treated water from R-2 (having more restrictions on reuses) to R-1 (a higher grade of recycled water having less restrictions on reuse). R-2 level means recycled water where the wastewater has undergone oxidation and disinfection; R-1 is the highest grade of recycled water. This recycled water would be able to be reused at the Klipper Golf Course, thus reducing overall water demand at MCBH.

Under the proposed action, MCBH is also proposing to haze aeʻo to discourage them from occupying hazardous areas of operation and construction. This may include hazing of aeʻo that are in eminent danger from construction/operational equipment or if access is needed to facilitate maintenance in hazardous areas to aeʻo (e.g., secondary clarifier). Hazing would be conducted by a biologist familiar with aeʻo biology (e.g., MCBH Natural Resources Staff or biological monitor) or by trained MCBH personnel. Hazing will consist of hand clapping and noise making (i.e., whistling) to deter aeʻo. If necessary and feasible, authorized individuals may walk slowly towards the aeʻo to haze it away from the hazard

<u>Conservation Measures</u>
MCBH staff and/or their representative contractors will implement the following conservation measures to avoid or minimize impacts to the aeʻo:

- During construction, the contractor would take all reasonable actions to quickly rid the construction area of standing water as soon as it is discovered.
- Stormwater detention basins would be covered in a manner to avoid attracting birds.
- Pre-construction surveys will be conducted daily by a qualified biologist to determine if any nesting is occurring and share any information with the contractors and facility operators. If an aeʻo nest or chicks are found within the WRF compound:
    - The Service, MCBH CLEO, and MCBH ECPD natural resources staff would be notified within 24 hours and would be provided access to witness mitigation measures.

  - If a nest is discovered, MCBH would establish a 50-foot buffer zone surrounding the nest and limit actions within the buffer. If the 50-foot buffer is not sufficient to prevent disturbance to a nesting ae‘o, the Service would be consulted to determine how far to extend the buffer. Construction outside the buffer area can be performed without limitations. Should the 50-foot buffer not be practical or effective considering the small footprint of the WRF, mitigations such as erecting a temporary fence that isolates the bird from construction activity may be implemented upon approval from Service and ECPD natural resources staff.
  - If the protective buffer or temporary fencing significantly impacts construction schedules or site development activities that are necessary to comply with regulatory requirements, WRF personnel (or its contractors) would consult with ECPD to implement a nest-specific plan to avoid the loss of eggs and death or injury of chicks, if feasible. Before any plan is implemented, ECPD would consult with the Service to determine the appropriate course of action to mitigate adverse effects to the nesting bird.
- The WRF personnel and construction contractors would notify the Bio monitor or in their absence the ECPD natural resources staff within 24 hours of discovery of any dead, dying, or injured birds.
- Eight-foot dust barrier fencing would be installed around the material and equipment laydown yard and temporary contractor on-site office space to limit fugitive dust, visual disturbances, act as a barrier to roaming chicks, and in general to keep wildlife out of active areas. The construction fence would remain in place until project completion. Water would periodically be sprayed on areas of barren soil created during construction activities to keep dust down when exposed to periodic trade winds.
- Install a 3-4 foot barricade fence around the site to be demolished. It would remain in place until all debris is removed from the area. During trenching and hole digging activities to install pipes or communication, utility, and electrical lines, open trenches and holes would be covered at the end of the workday or any extended period of time without activity, e.g., 2-3 hours or more.
- Vegetation at the WRF would be maintained at a height not to exceed three inches within all landscaped regions, and all vegetation would be removed from within sludge beds.
- Limit nighttime construction work and where possible, install sound barriers around generators or implement other applicable technologies to mitigate noise.
- Maintain a 5 mile per hour speed limit within the project areas to include the driveway that provides access to the WRF back entrance.
- MCBH plans to avoid putting sludge into the sludge beds from May- July to reduce the likelihood of stilts utilizing the area as a nesting site. Once the new redundant facility is constructed, the sludge beds will likely only be used as a last resort backup, due to unforeseen equipment failure requiring the digester material be diverted to it.
- Install a 2-foot silt fencing barrier at the base exterior of all new and existing fencing around the WRF perimeter, to reduce risk of adult birds and chicks from entering the property from the adjacent wetland.
- The secondary clarifier (final clarifier) would be covered, with netting not to exceed 0.75 inches mesh diameter. MCBH may evaluate using bird balls as possible secondary, but

not primary, additional deterrent measure. The primary clarifier will not be covered as aeʻo are not typically found there.
    - Larvicides may be used to control the blood worms in the secondary clarifier.
    - If access to the clarifier is needed to facilitate maintenance, MCBH staff will use handclapping or whistling to deter the stilts from the clarifier.
- The wet well will be covered with netting or metal grating and/ or construct a barrier around the equipment to keep birds out.
- A full-time biological monitor familiar with identification and behavior of the ESA-listed species would be on-site during all phases of construction, to include but not limited to mobilization, demolition, construction activities, demobilization, earth moving, and operational activities, to ensure that no federally listed waterbirds are unnecessarily hazed or inadvertently injured or killed by equipment and vehicle movement or construction activities.
    - The biological monitor would educate WRF operational personnel, project personnel, and contractors about the presence of federally listed species within and adjacent to the project site, legal responsibilities, agreed upon avoidance, minimization, and conservation measures, and notification protocols.
    - The biological monitor would survey and monitor the WRF compound and project site throughout the day while contracted workers are on-site.
    - The biological monitor would check all exposed trenches and holes to ensure the proper protective measures have been installed and that they are covered at the end of each workday.
    - The biological monitor would check the area for standing water and alert the contractor to eliminate water as quickly as possible.
    - The biological monitor would notify the Environmental natural resources staff of any observed ESA violations or potentially unauthorized or illegal activities and actions.

Action Area

The action area is defined at (50 CFR 402.02) as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” The Service has determined that the action area for this project includes the existing WRF at MCBH, west of the Main Gate and east of the marina. The facility is adjacent to Kāneʻohe Bay on the southwest, and the Salvage Yard wetland on the west. Existing support facilities are on the north, and power substation facilities and the main gate are on the east (Figures 1-4).

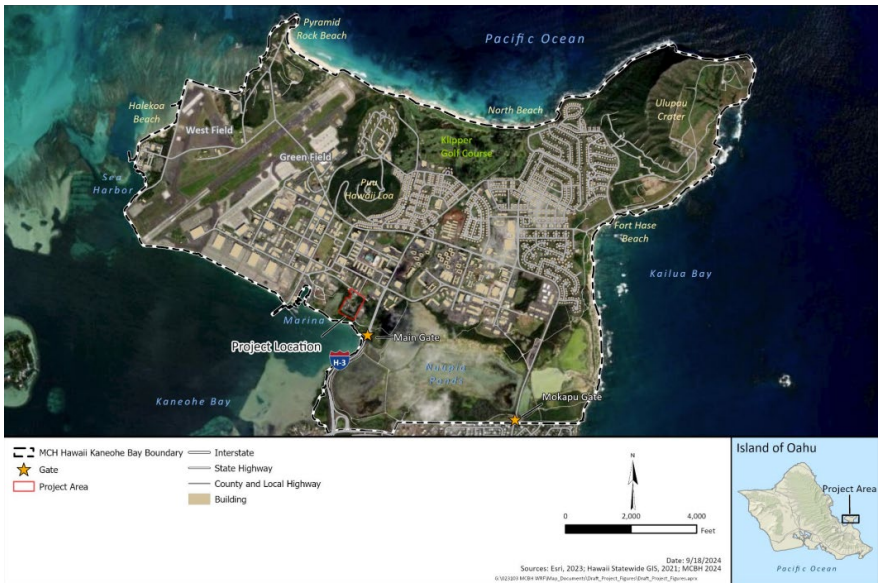

Figure 2. Project Location at MCBH Kāneʻohe Bay. Project Area outlined in red.

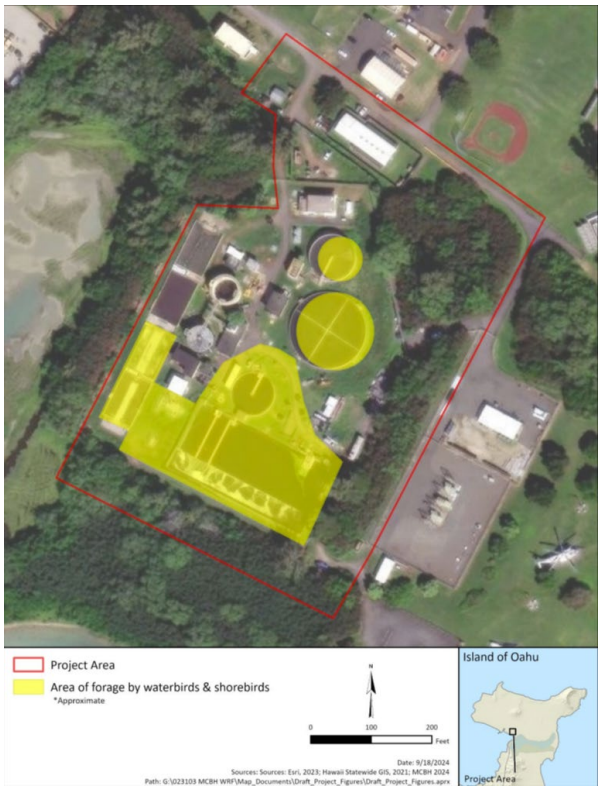

Figure 3. Water Reclamation Facility and Hawaiian Waterbird Forage Area.

Figure 4. Proposed Construction Laydown Areas and Haul Routes.

Analytical Framework for the Jeopardy Analysis

In accordance with regulation (see 84 FR 44976), the jeopardy determination in this Biological Opinion relies on the following four components:

1. The *Status of the Species*, which evaluates the species' current range-wide condition relative to its reproduction, numbers, and distribution; the factors responsible for that condition; its survival and recovery needs; and explains if the species' current range-wide population is likely to persist while retaining the potential for recovery or is not viable.
2. The *Environmental Baseline*, which evaluates the current condition of the species in the action area relative to its reproduction, numbers, and distribution absent the consequences of the proposed action; the factors responsible for that condition; and the relationship of the action area to the survival and recovery of the species.
3. The *Effects of the Action*, which evaluates all future consequences to the species that are reasonably certain to be caused by the proposed action, including the consequences of other activities that are caused by the proposed action, and how those impacts are likely to influence the survival and recovery role of the action area for the species; and
4. *Cumulative Effects*, which evaluates the consequences of future, non-Federal activities reasonably certain to occur in the action area on the species, and how those impacts are likely to influence the survival and recovery role of the action area for the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the consequences of the proposed Federal action in the context of the species' current range-wide status, considering any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild. The key to making this finding is clearly establishing the role of the action area in the conservation of the species, and how the effects of the proposed action, taken together with cumulative effects, are likely to alter that role and the continued existence (i.e., survival) of the species.

Status of the Species

Hawaiian Stilt or Aeʻo (*Himantopus mexicanus knudseni*)

Species Description
The aeʻo is part of a superspecies complex of stilts (Family: *Himantopus*) and is considered a distinct subspecies of the black-necked stilt (Himantopus mexicanus) (Service 2011, p. 45). Aeʻo are slender wading birds, black above (except for the forehead), white below, and with distinctive long, pink legs. Sexes are distinguished by the color of the back feathers (brownish female, black male) as well as by voice, which is lower in females. Downy chicks are well camouflaged, tan with black speckling. Immature birds have a brownish back and white patches on their cheeks (Hawaii Audubon Society 2005, p. 49). The total length of adult aeʻo is about 16 inches with the mass of males and females averaging 7.0 ± 0.49 ounces (n=42) and 7.27 ± 0.77 ounces (n=43), respectively (Robinson et al. 1999, p. 16).

Listing Status
The aeʻo was listed as endangered in 1970 (Service 1970) pursuant to the Endangered Species Preservation Act of 1966. The original recovery plan was approved in 1978, revised in 1985, and revised a second time in 2011. Critical habitat has not been designated for this species.

Historic and Current Distribution
Aeʻo were historically known from all the main Hawaiian Islands, except Lānaʻi and Kahoʻolawe (Service 2011, p. 46). No historical estimate of aeʻo population size is available, but by the early 1940, the statewide population was estimated to be between 200 and 1,000 birds (Service 2011, p. 46). However, these population estimates did not account for aeʻo present on Niʻihau and are therefore considered underestimates. Aeʻo are currently found on all of the main Hawaiian Islands, except Kahoʻolawe. Though aeʻo census data show high year-to-year variability in the number of birds observed (Service 2011, p. 47), long-term census data indicate that the statewide population has been relatively stable or slightly increasing. Currently, this trend has continued and the statewide aeʻo population is considered to be stable to increasing with an average of approximately 1,500 birds over the 10-year period of 1998 to 2007 (DOFAW 1976-2008; Service 2011, p. 47-49). The data for aeʻo collected between 2006 and 2016 for winter and summer surveys show fluctuations ranging from 1,400 to 2,200 individuals. Surveys where counts have surpassed 2,000 individuals have been followed in the subsequent year by a decrease of 300 to 700 birds (Service 2020a, p. 3). This variability in count numbers can be partially explained by variation in reproductive success and depredation. While the number of aeʻo counted on surveys has not consistently exceeded 2,000 individuals during winter or

summer counts for at least 5 consecutive years, the population has remained relatively stable over the years (Service 2020a, p. 5).

Life History

Aeʻo use a variety of aquatic habitats but are limited by water depth and vegetation cover. They are known to use ephemeral lakes, anchialine pools, prawn farm ponds, marshlands and tidal flats. Foraging habitat for the aeʻo is early successional marshland or other aquatic habitat with a water depth less than 9 inches and perennial vegetation that is limited and low growing. Native low-growing wetland plants associated with stilt nesting areas include *Bacopa monnieri* (water hyssop), *Sesuvium portulacastrum* (sea purslane), and the sedges *Cyperus laevigatus* (makaloa) and *Bolboschoenus maritimus* (kaluha). Aeʻo use kalo ponds in the early stages of planting, but do not frequent closed canopy loʻi kalo (Service 2011, p. 59).

Aeʻo prefer to nest on freshly exposed mudflats interspersed with low growing vegetation (Service 2011, p. 57). Nesting also occurs on islands (natural and manmade) in freshwater or brackish ponds (Shallenberger 1977, p. 23, Coleman 1981, p. 42). The nest itself is usually a simple scrape on the ground but may also be a shallow bowl with vegetation and other debris (Shallenberger 1977, p. 24). Aeʻo have also been observed using sticks, small pebbles, shells, small dirt clods, and debris for nesting material (Coleman 1981, p. 53).

The aeʻo nesting season normally extends from mid-February through August, with peak nesting varying among years (Robinson et al. 1999. pg. 14). Aeʻo usually lay three to four eggs that are incubated for 23 to 26 days (Coleman 1981, p. 61, Reed et al. 1998, p. 37). Both parents take turns incubating the eggs day and night (Coleman 1981, p. 61; Shallenberger 1977, p. 24). Chicks are precocial and are able to walk and swim within a few hours of hatching (Coleman 1981, p. 77). Aeʻo chicks fledge about 28 days after hatching (Reed et al. 1999, p. 478). Young may remain with both parents as late as February of the year after hatch (Robinson et al. 1999, p. 19). First-year survival has been estimated at 0.55, with higher estimated mortality in the first two months compared with subsequent months (Reed et al. 2015, p. 179). Adult survival was similar for both sexes, with estimates of 0.79 for females and 0.80 for males (Reed et al. 2015, p. 179). The oldest females observed were seen 16 and 19 years after hatch. Six males lived to at least 16 years, with one observed 29 years after banding (Reed et al. 2015, p. 179). It is important to note that the aeʻo in this survival study were located at protected sites with predator control and public access management; in the absence of this active management survival rates are expected to be much lower (Reed et al. 2015, p. 183).

Aeʻo are opportunistic feeders. They eat a wide variety of invertebrates and other aquatic organisms available in shallow water and mudflats. Specific organisms taken include water boatmen (*Corixidae*), beetles (*Coleoptera*), possibly brine fly (*Ephydra riparia*) larvae, polychaete worms, small crabs, Mozambique tilapia (*Tilapia mossambica*), western mosquito fish (*Gambusia affinis*), and tadpoles (*Rhinella spp*.) (Service 2011, p. 59). Ephemeral ponds provide an immediate and short term food supply with the emergence of invertebrates (Service 2011, p. 60).

General Threats
The primary threats to the aeʻo involve depredation by nonnative predators and habitat loss. The limited availability of open, early successional shallow wetland habitat has become an issue in increasing the stability of the aeʻo population. The major source of uncertainty comes from the increasing concerns of sea level rise. Because almost all aeʻo habitat is in coastal wetlands, sea level rise is likely both to inundate existing habitat and to result in establishment of some new habitat upslope. (Service 2020a, p.6).

Environmental Baseline

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated and/or ongoing impacts of all proposed federal projects in the action area that have undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

Status of Aeʻo within the action area
From 2019 to 2024, biannual waterbird survey counts at the WRF on MCBH averaged a mean number of 9.25 (SD 3.93, range 4-17, n=12) (Figure 5). Additionally, waterbird survey counts at the Salvage Yard Wetland on MCBH (west of the WRF) averaged a mean number of 3.58 (SD 1.80, range 1-8, n=12) (Figure 6). Likely due to the recent increased construction at the WRF, bird counts were slightly lower in 2024 as compared to the previous years. The Salvage Yard Wetland numbers remained to be within historical norms, with a slight increase in January 2024 and a corresponding decrease at the WRF (Bookless pers. comm. 2024). Stilt nests have been recorded twice in the WRF sludge drying beds in the last 5 years. Besides the WRF, stilts have also been routinely recorded foraging in other nearby areas, specifically in the lawn area where aircraft static displays and the Pacific War Memorial are located on H-3 Entry Control Point, as well as numerous stilts loading in the entry driveway. As many as 15 stilts have been counted at one time foraging or loafing in this area.

On November 18, 2024, 5 dead aeʻo were discovered floating in the upper ponds of the WRF. MCBH notified the Service via email on November 19, 2024, and provided the associated mortality form. It was speculated in the form that the aeʻo most likely had been foraging or fighting near the drain of the secondary clarifier, sucked down and drowned in the pipes. separate occasions. In preparation of storm surges, the drain cover had been removed per standard operating procedures.

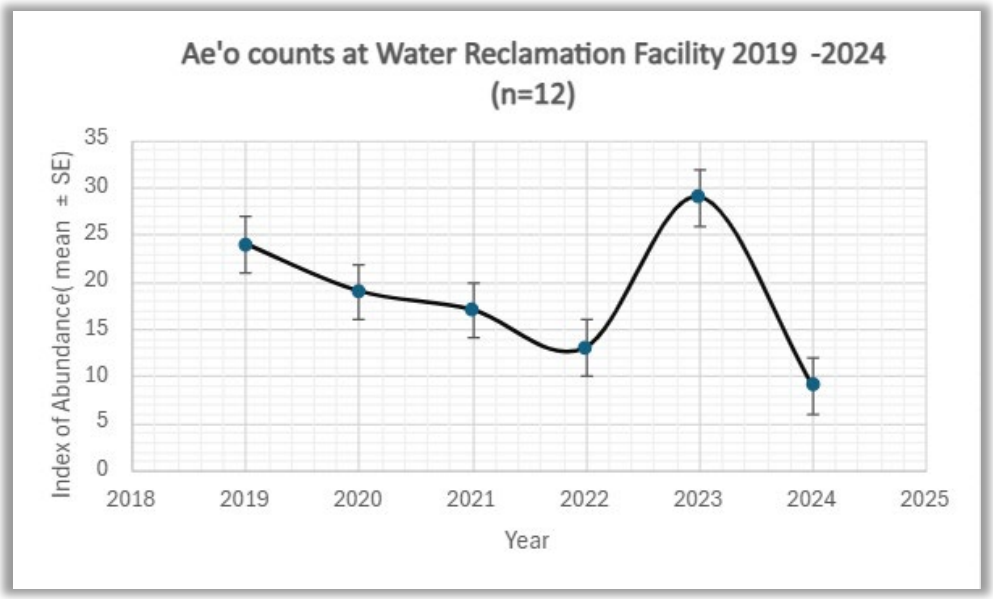

Figure 5: Index abundance of aeʻo at MCBH Water Reclamation Facility from 2019 to 2024.

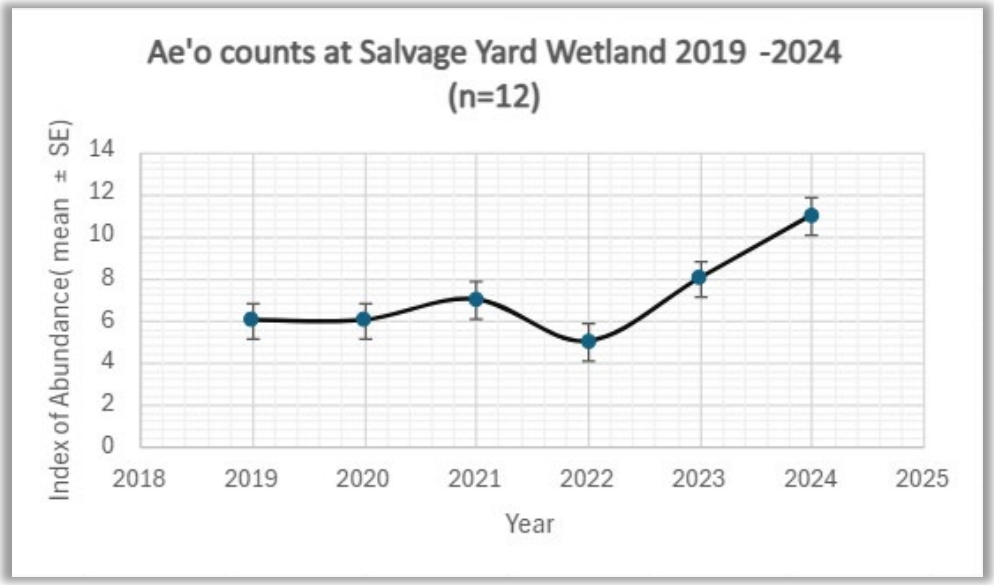

Figure 6: Index of abundance of aeʻo at MCBH Salvage Yard Wetland from 2019 to 2024.

Effects of the Action

The likely effects to the aeʻo include effects associated with: 1) disturbance from activities occurring near nests found within the action area; 2) hazing of aeʻo; and 3) drain cover removal at the primary and secondary clarifiers. Each stressor and benefit caused by the proposed actions may have consequences to the aeʻo. The consequences of the proposed actions on the aeʻo are discussed below.

Consequences of the Proposed Action on Aeʻo

1) Effects Associated with Activities Occurring Near Nests

Within the WRF, ae'o are known to occur near the secondary clarifier, and have nested twice in the WRF sludge drying beds in the last 5 years. Based on the project information provided, if a nest is discovered within the project footprint during construction or operations of the facility, MCBH would establish a 50-foot buffer zone surrounding the nest and limit actions within the buffer for all base personnel and contractors. However, to reliably avoid adverse effects that lead to take of aeʻo eggs or chicks, the Service has recommended the establishment and maintenance of a 100 ft buffer around all active nests until the chicks have fledged as a long standing avoidance and minimization measure. With a buffer half the recommended distance, it is likely that disturbance caused by activities occurring in such close proximity to nests could lead to nest abandonment. MCBH will implement conservation measures to remove vegetation within the sludge beds to reduce suitable nesting habitat and conduct pre-construction surveys to determine if any nesting is occurring in the area. Despite implementation of these conservation measures, activities occurring near nests are likely to result in disturbance that may lead to nest abandonment of aeʻo.

To estimate the number of nests that could be abandoned, we used data of nests documented at the WRF for the aeʻo. We also considered the proposed conservation measures being implemented and the potential for nests at the WRF in the future. Data has shown that two nests were observed for aeʻo within the WRF over the past 5 years. Considering the aeʻo population has remained relatively stable at the WRF; despite some conservation measures deterring nesting (i.e., hazing), we anticipate nesting could remain at similar levels here in the future. Therefore, it is anticipated that all eggs or chicks of up to 2 aeʻo nests every 5 years may be taken in the form of injury or mortality due to nest failure or abandonment as a result of disturbance associated with WRF construction and operation activities.

2) Effects Associated with Hazing of Aeʻo

Hazing of aeʻo, as proposed, is anticipated to have impacts that do not rise to the level of take. Hazing will be used to deter aeʻo from occupying hazardous areas of operation and construction. Techniques used (i.e., hand clapping or noise making) will be conducted by biologists or trained individuals. When hazed, aeʻo are expected to be startled, disturbed, and to temporarily abandon their normal behavior and the areas they currently occupy. They may be stressed, miss feeding, or may leave the area. However, these disruptions to their normal behavior would not result in reduced fitness, physical injury, or mortality because the disruptions are temporary. This type of hazing is not expected to reduce the fitness or survivorship of aeʻo and will remove birds from areas of imminent danger or threat. Considering the hazing activities as proposed, we do not expect it to result in any meaningful disruption to their normal

behaviors, nor any measurable reduction in reproductive success or reduced fitness. Therefore, effects to aeʻo associated with hazing are expected to be insignificant.

3) Effects Associated with Drain Cover Removal at the Primary and Secondary Clarifiers

On November 18, 2024, 5 dead aeʻo were discovered at the WRF secondary clarifier ponds. It had been speculated that they had been likely foraging or fighting near the secondary clarifier drain, sucked down and drowned in the pipes. Since it is standard procedure to remove the drain covers in preparation of storm surges, MCBH will cover the secondary clarifier with netting not to exceed 0.75 inches mesh diameter. MCBH may evaluate using bird balls as possible secondary, but not primary, additional deterrent measure. The netting will prevent aeʻo from accessing the area where they can be sucked down the clarifier drain when the cover is removed due to normal operating procedures. The primary clarifier will not be netted because birds are not typically found there.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any future state, tribal, local, or private actions that are reasonably certain to occur within the action area at this time; therefore, no cumulative effects are anticipated.

Conclusion

For the proposed project at MCBH, conservation measures are anticipated to avoid and minimize many of the probable adverse effects, such as clearing areas with standing water to prevent attraction to the aeʻo, conducting pre-construction surveys to identify species and determine if nesting is occurring in the area, and utilizing physical deterrents or netting to prevent the aeʻo from accessing certain areas. However, it is anticipated that all eggs or chicks associated with up to 2 aeʻo nests every 5 years may be taken in the form of injury or mortality due to nest failure or abandonment as a result of the proposed construction and operational activities. This impact represents a very slight reduction in reproductive success, so it is not expected to change the overall population levels of aeʻo on MCBH. Since the overall population on MCBH is not expected to change, the proposed project is not expected to appreciably reduce the numbers, reproduction, or distribution of aeʻo throughout its range. Therefore, after reviewing the current status of the aeʻo, the environmental baseline for the action area, the effects of the proposed construction and operation of the WRF upgrade, and the cumulative effects, it is the Service's biological opinion that the WRF upgrade, as proposed, is not likely to jeopardize the continued existence of the aeʻo. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations promulgated pursuant to section 4(d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by MCBH so that they become binding conditions in order for the exemption in section 7(o)(2) to apply. MCBH has a continuing duty to regulate the activity covered by this incidental take statement. If MCBH (1) fails to assume and implement the terms and conditions or (2) fails to require any contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any permit or contract, then the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, MCBH must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement and reporting requirements below [50 CFR § 402.14(i)(3)].

Amount or Extent of Take Anticipated

The Service anticipates the following take of ae‘o:

- All eggs or chicks associated with up to two (2) ae‘o nests every five years may be taken the form of in the form of injury or mortality due to nest failure or abandonment, because of disturbance associated with WRF construction and operational activities.

Effect of Take

In this biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy of the ae‘o.

Reasonable and Prudent Measures

The reasonable and prudent measure given below, with their implementing terms and conditions, are designed to minimize the impacts of incidental take that might otherwise result from the proposed actions. The following reasonable and prudent measure is necessary and appropriate to minimize the effect of take on the ae‘o. The reasonable and prudent measure described below are non-discretionary and must be implemented.

1. MCBH will minimize the potential for injury or mortality of ae‘o due to nest failure or abandonment associated with disturbance from WRF construction and operational activities.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, MCBH must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting or monitoring requirements. These terms and conditions are nondiscretionary. The following terms and conditions apply to the reasonable and prudent measure above:

- MCBH will notify the Service by email or telephone within 48 hours upon the discovery of an ae‘o nest. While monitoring the nest (e.g., biological monitor), if the nest is discovered to be abandoned or failed, MCBH will notify the Service within 24 hours upon discovery and provide the Service a written after-action report, summarizing the event, within 30 days. The report will will include details such as date/time of nest discovery, nest details (e.g. number of eggs, age/lay date, etc.), location, efforts to prevent nesting in the area (i.e., monitoring, vegetation maintenance), and details of nest failure/abandonment.

- MCBH will provide the Service with an annual report summarizing the levels of take (summary of written notifications and after-action reports above). Annual reports will be submitted to the Service by January 1 following the end of each fiscal year. If an extension is needed, MCBH will notify the Service to coordinate. If no incidents of take occur in a fiscal year, notification by email to the Service may occur in lieu of an annual report.

- Should take of listed species occur and the carcass recovered, the Service may request that the carcass be subjected to necropsy. Otherwise, the depository designated to receive specimens that are found is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawai‘i, 96817 (telephone: 808/847-3511). If the B.P. Bishop Museum does not wish to accession the specimens, contact the Service’s Division of Law Enforcement in Honolulu, Hawai‘i (telephone: 808/861-8525; fax: 808/861-8515) for instructions on disposition.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- MCBH should support efforts and contribute funds to projects that support the recovery and conservation of ae ‘o and their inhabitants off installation.
- MCBH should consider efforts to assess other techniques/measures to deter ae ‘o from hazardous areas at the WRF.

In order for PIFWO to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, PIFWO requests notification of the implementation of any conservation recommendations.

Reinitiation-Closing Statement

This concludes formal consultation on the action(s) outlined in this biological opinion. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if 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; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your efforts to conserve protected species. If you have any questions concerning this biological opinion, please contact Nikki Imamura, Fish and Wildlife Biologist, at (808) 792-9400 or by email at nikki_imamura@fws.gov. When referring to this project, please include this reference number**: 2025-0014888-S7**.

Sincerely,

AARON NADIG Digitally signed by AARON NADIG Date: 2025.03.28 07:08:16 -10'00'

Deputy Field Supervisor
Programmatic Operations

LITERATURE CITED

Coleman, R. A. 1981. The reproductive biology of the Hawaiian subspecies of the black-necked stilts (*Himantopus mexicanus knudseni*). Ph.D. diss., Pennsylvania State Univ. 106 pp.

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Personal Communications

Bookless, Lance. October 8, 2024. Senior Natural Resources Manager at MCBH. Email correspondence between the U.S. Fish and Wildlife Service and MCBH personnel.

Bookless, Lance. November 19, 2024. Senior Natural Resources Manager at MCBH. Email correspondence between MCBH notifying Service staff of an incident involving ae‘o found deceased in the secondary clarifier.

Bookless, Lance. November 19, 2024. Senior Natural Resources Manager at MCBH. Phone call correspondence between MCBH notifying Service staff of an incident involving ae‘o found deceased in the secondary clarifier.

Bookless, Lance. December 9, 2024. Senior Natural Resources Manager at MCBH. Email correspondence between MCBH and the U.S. Fish and Wildlife Service submitting all information requested.

Bookless, Lance. December 12, 2024. Senior Natural Resources Manager at MCBH. Email correspondence between MCBH and the U.S. Fish and Wildlife Service confirming the proposed 42-day extension to the timeline of the biological opinion.

Bookless, Lance. February 11, 2025. Senior Natural Resources Manager at MCBH. Phone call correspondence between MCBH and the U.S. Fish and Wildlife Service providing updates on the proposed barbed wire fencing construction activities.

Bookless, Lance. March 12, 2025. Senior Natural Resources Manager at MCBH. Email correspondence between MCBH and the U.S. Fish and Wildlife Service confirming adjusted language on proposed hazing measures.

[Service] U. S. Fish and Wildlife Service. November 4, 2024. Email correspondence between the U.S. Fish and Wildlife Service and MCBH personnel providing letter of initiation of formal consultation.

[Service] U. S. Fish and Wildlife Service. December 12, 2024. Email correspondence between the U.S. Fish and Wildlife Service and MCBH personnel proposing a 42-day extension to the timeline of the biological opinion.

[Service] U. S. Fish and Wildlife Service. February 11, 2025. Email correspondence between MCBH and the U.S. Fish and Wildlife Service confirming updates on proposed construction activities.

[Service] U. S. Fish and Wildlife Service. March 11, 2025. Email correspondence between MCBH and the U.S. Fish and Wildlife Service regarding adjusted language on proposed hazing measures

APPENDIX A

United States Department of the Interior

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

In Reply Refer To:
2025-0014888- S7

March 28, 2025

Major Jeffry Hart
Environmental Compliance and Protection Director
Marine Corps Base Hawai‘i
Box 63002
Kāne‘ohe Bay, HI 96863-3002

Subject: Informal Consultation for the Marine Corps Base Hawai‘i Wastewater Reclamation Facility (WRF) Upgrade Kāne‘ohe Bay, Hawai‘i

Dear Major Hart:

The U.S. Fish and Wildlife Service (Service) received your letter on October 8, 2024 requesting our concurrence with your determination that the proposed Marine Corps Base Hawai‘i (MCBH) Wastewater Reclamation Facility (WRF) Upgrade in Kāne‘ohe Bay, Hawai‘i may affect, but is not likely to adversely affect the endangered Hawaiian hoary bat or ‘ōpe‘ape‘a (Lasiurus cinereus semotus); and the endangered Hawaiian petrel or ‘ua‘u (Pterodroma sandwichensis), the threatened Newell’s Townsend’s shearwater or ‘a‘o (Puffinus auricularis newelli), and the endangered Hawai‘i distinct population segment (DPS) of band-rumped storm petrel or ‘akē‘akē (Hydrobates castro) (hereafter collectively referred to as Hawaiian seabirds). On November 4, 2024, the Service and MCBH agreed the Service would transmit our concurrence letter together with the final biological opinion to MCBH. On December 12, 2024, the Service and MCBH agreed to a 42-day extension on the timeline of the biological opinion to ensure all new and pertinent information provided would be appropriately incorporated.

The findings and recommendations in this consultation are based on (1) your biological assessment; (2) email and phone correspondence with the Service and MCBH between October 8, 2024 and March 12, 2025; and (3) other information available to us. A complete administrative record is on file in our Pacific Islands Fish and Wildlife Office in Honolulu, Hawai‘i. This response is in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.).

Project Description

The proposed action is to construct and operate a redundant wastewater treatment system, ensuring that treated effluent continues to meet existing permit limitations during planned maintenance events. In order for MCBH to reach compliance standards with its Hawai‘i State Department of Health (DOH) discharge permit #HI0110078, the base must have a means to continue to treat wastewater while components undergo repair or maintenance. The purpose of the proposed action is to eliminate the need for planned maintenance events, meet water quality and disinfection permit standards, provide new water reuse capabilities on base, and meet tsunami design standards. The facility would also include increased fencing, consisting of an 8-foot-tall fence, limited to approximately 2,100 linear feet of 3-strand barbed wire. Furthermore, the proposed action would allow the WRF to maintain full capacity during maintenance activities. The proposed action would occur at the existing WRF entirely within MCBH. No construction work would take place within the neighboring Salvage Yard wetland to the west. The construction aspect of the project will occur over a 3-year period from Fiscal Year 2025 through Fiscal Year 2028. The construction would be done in phases to mitigate disruptions and maintain operation of the WRF.

Conservation Measures

The following conservation measures will be implemented as a part of the proposed project to avoid and minimize impacts to listed species and their habitats.

Ōpe‘ape‘a

- Removal, pruning, or trimming of trees and vegetation during bat pupping season would be avoided.
    - No pruning or trimming of trees and vegetation 15 feet or greater would be removed during the Hawaiian hoary bat pupping season (1 June –15 September).

Hawaiian seabirds

- Night work would be minimized during proposed construction to the greatest extent possible. If night work occurs, the following measures would be implemented:
    - Night lighting would be shielded, directed downward, use motion detectors or other automatic controls, and the lowest possible lumens. The necessary amount of exterior light would be determined for safety purposes.
    - Contractor would notify the MCBH Environmental Division in advance of any night work and would be briefed on wildlife concerns (e.g., seabird fallout) and minimization measures.
    - If a downed seabird is observed, contractors would contact the MCBH Environmental Division staff immediately to report the observation.
    - Limit use of lights for any training operations during the seabird fledging period (September– December), especially during new moon phases.
- MCBH is striving to incorporate wildlife friendly lighting associated with existing lighting and with projects requiring new, repaired, or upgraded lighting. Lighting would follow the rule–keep it low, long, and shielded. All lighting would meet the following minimum criteria unless otherwise determined by critical mission requirements:
    - Install light fixtures as low as possible to the ground.

- Use long wavelength (greater than 560 nanometers) light sources.
- Shielded, downward directed, and full cutoff so that the lamp or glowing lens is not visible from the side or above. Uplighting is prohibited.
- Controlled. Only be "On" when needed. 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. Use the lowest wattage or lumen output necessary for the needed purpose and personnel safety. This would conserve energy and reduces harmful effects on plants, animals, and people.
- Use full cutoff downward/shielded bollards in parking areas and sidewalks, and full cutoff downward/shielded wall packs for walkways and entrances/exits.
- Minimize the height of pole lighting–15 feet in height or lower where possible.

Analysis of Effects on Listed Species

Ōpeʻapeʻa

ʻŌpeʻapeʻa forage for insects from as low as three feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing. When bats forage and consume invertebrates, their sonar is disrupted while they are masticating, making them more prone to colliding with obstacles when flying. Thin strands of barbed wire may be difficult for bats to detect. Specifically for this project, MCBH proposes to construct an 8-foot-tall fence, limited to approximately 2,100 linear feet of 3-strand barbed wire. Although it is possible for bats to collide with the barbed wire fence, no suitable foraging habitat is found nearby the action area for this project. Since many areas of the fence will be in close proximity to taller structures (e.g., buildings, facilities, tall vegetation/trees), bats are unlikely to be foraging in the vicinity of the barbed wire fence so as to avoid collision with larger structures nearby. Furthermore, ʻōpeʻapeʻa have been detected on MCBH on a transitory basis, however no roosting sites or nests have been identified. Surveys completed in 2021, including one site 0.35 miles southeast of the WRF and the Salvage Yard wetland, detected bats during August through December with low foraging activity. With the low detection rates observed, bat occurence in the area is presumably limited. Therefore, considering the lack of suitable foraging habitat and the low density of bats in the area, it is highly unlikely bats would collide with te proposed barbed wire fencing. Because impacts to ʻōpeʻapeʻa from the barbed wire fencing are highly unlikely to occur, adverse effects are therefore considered discountable.

ʻŌpeʻapeʻa roosts in both native and non-native woody vegetation across all major Hawaiian Islands and will leave young unattended in trees and shrubs when they forage. Proposed vegetation clearing may impact bats through the loss of potential roosting habitat. When trees or shrubs, 15 ft or taller, are cleared during the pupping season (June 1 through September 15), there is a risk that young bats could inadvertently be harmed or killed since they are too young to move away from their roost tree. However, conservation measures include no clearing of vegetation taller than 15 feet during the bat pupping season. Therefore, with the implementation of the conservation measures above, it is highly unlikely the ʻōpeʻapeʻa would be impacted by

vegetation clearing. Because impacts to the ōpeʻapeʻa from vegetation clearing are highly unlikely to occur, adverse effects are therefore considered discountable.

Hawaiian seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). 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. To date, no listed Hawaiian seabirds have been documented within the WRF project area. Based on the conservation measures listed above, night work will be minimized to the greatest extent possible while following specific minimization measures (e.g., shielded, downward, automatic controls, etc.), and any new lighting will also follow minimization measures (e.g., shielded, controlled, timers, etc.). Considering the low presence of Hawaiian seabirds within the project area and the implementation of the conservation measures above, impacts from lighting associated with this project are highly unlikely to occur. Because impacts to Hawaiian seabirds are highly unlikely to occur, adverse effects are therefore considered discountable.

Summary

We have reviewed our data and conducted an effects analysis of your project. Based on the project actions as described above and the incorporation of conservation measures, effects to listed species are extremely unlikely to occur and are therefore considered discountable. Because impacts from the proposed action are considered discountable, the Service concurs with your determination that the proposed action may affect but is not likely to adversely affect ōpeʻapeʻa and Hawaiian seabirds.

We appreciate your efforts to conserve endangered species. If you have any questions regarding this letter, please contact Nikki Imamura, Fish and Wildlife Biologist at 808-792-9400 or email: nikki_imamura@fws.gov. When referring to this project, please include the reference number: **2025-0014888-S7**.

Sincerely,

AARON NADIG Digitally signed by AARON NADIG Date: 2025.03.28 07:08:53 -10'00'

Deputy Field Supervisor
Programmatic Operations

From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Thursday, December 12, 2024 8:42 AM
To: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: [Non-DoD Source] Re: [EXTERNAL] RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

Thank you for your response. I appreciate the clarification you've provided for this project and will have these measures incorporated into the biological opinion. As you are aware, this consultation was initiated on November 4, 2024 and the original deadline for the completion of this biological opinion was set for February 20, 2025. However, due to our request for additional information and added recommendations to the avoidance and minimization measures, an extended timeframe would best allow for a more thorough evaluation of the potential impacts resulting from this project.

Since 42 days have passed from the time I sent my initial email requesting for additional

information to your most recent response (October 28, 2024 through December 9, 2024), we would like to add an extension of 42 days to ensure that all pertinent information is adequately reviewed and considered. The revised submission deadline for this biological opinion would be no later than **April 3, 2025**.

Thanks so much, looking forward to your response and will be able to address any further questions/concerns.

Best,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

From: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Sent: Monday, December 9, 2024 10:54 AM
To: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: [EXTERNAL] RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

From: Bookless CIV Lance S
Sent: Monday, December 9, 2024 10:55 AM
To: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>; Crile CIV Patrick David <patrick.crile@usmc.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hirano CTR Wesley R <wesley.hirano.ctr@usmc.mil>
Subject: RE: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Nikki,

Here are the Avoidance, Minimization, and Conservation measures and BMPs MCBH can commit to:

1. We will cover the secondary clarifier, also called the final clarifier, with netting not to exceed ¾ inches mesh diameter, and may evaluate using balls as possible secondary, but not primary, additional deterrent measure.

2. Larvicides may be used to control the blood worms in the secondary clarifier.

3. If we need access to the clarifier to facilitate maintenance, we will use hand-clapping or whistling to deter the stilts from hanging out in and around the clarifier.

4. We will cover the wet well with netting or metal grating and/or construct a barrier around the equipment to keep birds out.

5. We do not plan to cover the sludge beds, but will keep it vegetation free and may avoid putting sludge in it from May-July to reduce the likelihood stilts will attempt to use it as a nest site. Once the new redundant facility is constructed, the sludge beds will likely only be used as a last resort backup due to unforeseen equipment failure requiring the digester material be diverted to it.

We recommend the BO cover the next 10 years.

The proposed fence with barbed is identified in Figure 2-1 of the BA and is identified by the symbol "-X---X-" . The perimeter fence encloses the entire WRF.

R/s,

Lance Bookless

Senior Natural Resources Mgr /Installation Pest Mgt Coordinator/Certified arborist
Marine Corps Base Hawaii
Environmental Division
Box 63062 B1359
MCBH Kaneohe Bay, HI 96863-3062

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✉: lance.bookless1@usmc.mil

From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Tuesday, November 26, 2024 4:11 PM
To: Bookless CIV Lance S <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>
Subject: [Non-DoD Source] Re: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

I'm currently working on drafting the BO, and I wanted to quickly follow up to see if you

had any questions regarding some of the concerns I've noted earlier. I also wanted to follow up on your confirmation regarding the conservation measures proposed in Ryan's previous email. If you'd like to discuss further, please let me know.

Mahalo,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

From: Imamura, Nikki Elizabeth R <nikki_imamura@fws.gov>
Sent: Monday, October 28, 2024 7:15 PM
To: Bookless Lance <lance.bookless1@usmc.mil>
Cc: Pe'a, Ryan <ryan_pea@fws.gov>; Christensen CIV Dain L <dain.christensen@usmc.mil>
Subject: MCBH Wastewater Reclamation Facility BA Additional Questions/Clarification

Aloha Lance,

Hope all has been well with you. I wanted to update you as I will be the POC for the Wastewater Reclamation Facility BO. After reading through the BA, I wanted to touch base and get some clarification on a few of the concerns we've noted.

- Looking at the overall timing of this project, a 3 year period does not seem to cover operations beyond that timeframe. Would you prefer to have this BO cover general operations beyond the construction upgrades? If so, we would recommend that the BO cover no more than 10 years total.

- For the areas impacting the Hawaiian hoary bat, is there a proposed location for the barbed wire installation? If so, we would need a map of the action area.

- In terms of stilt impacts, we had some concerns with the bird deterrents and hazing efforts listed under the BMPs. I spoke with Ryan and he mentioned he provided feedback on the hazing measures awhile back (which I've attached below), so we wanted to recommend a few alternatives. In general, the hazing methods listed would cause adverse effects and do more harm than good, so it would be best to alter the wording. If you'd like to implement hazing, we'd recommend using hand-clapping and noise-making (i.e.

whistling) to help deter the stilts. If any type of hazing is implemented, we would analyze its impacts, but it also needs to be clear what the hazing is for (i.e. prevent stilts from occupying areas of construction equipment that may cause injury?).

If you have any questions regarding these comments or would like to discuss further, please let me know.

Thanks so much,
Nikki

Nicole R. Imamura
Fish and Wildlife Biologist | Planning and Consultation Team
Pacific Islands Fish and Wildlife Office
US Fish and Wildlife Services
300 Ala Moana Blvd Rm 3-122
Honolulu, Hawai'i 96850
(808) 460-7074

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:
2025-0014888-S7

November 4, 2024

Lance Bookless
Senior Natural Resources Manager
Marine Corps Base Hawai‘i
Environmental Division
Box 63062 B1359
MCBH Kāne‘ohe Bay, HI
96863-3062

Subject: Initiation of Formal Consultation for Marine Corps Base Hawai‘i Wastewater Reclamation Facility (WRF) Upgrade Kāne‘ohe Bay, Hawaii

Dear Mr. Bookless:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of the Marine Corps Base Hawai'i (MCBH) October 8, 2024, electronic mail for the proposed Wastewater Reclamation Facility upgrades in Kāne‘ohe Bay, Hawaii requesting initiation of formal section 7 consultation under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.). At issue are the potential adverse effects of the proposed project on the endangered Hawaiian stilt or Ae‘o (*Himantopus mexicanus knudseni*). Additionally, you requested our concurrence with your determination that the proposed action is not likely to adversely affect the endangered Hawaiian hoary bat or ‘ōpe‘ape‘a (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel or ‘Ua‘u (*Pterodroma sandwichensis*), the threatened Newell's shearwater or ‘A‘o (*Puffinus newelli*), and the endangered Hawai‘i Distinct Population Segment (DPS) of band-rumped storm petrel or ‘Akē ‘akē (*Hydrobates castro*) pursuant to section 7 of the Act.

All information for you to initiate formal section 7 consultation was either included in your electronic mail or is otherwise accessible for consideration and reference. Formal consultation was initiated on October 8, 2024. We have assigned log number 2025-0014888-S7 to this consultation. Please refer to this number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually

agree to an extension). Therefore, we expect to provide you with our biological opinion no later than February 20, 2025.

As a reminder, the ESA requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice ensures agency actions do not preclude the formulation or implementation or reasonable and prudent alternatives that avoid jeopardizing the continued existence or endangered or threatened species or destroying or modifying their critical habitats.

We appreciate the opportunity to assist you with the proposed project. If you have questions regarding this response, please contact Nikki Imamura, Fish and Wildlife Biologist (phone: 808-792-9400, email: nikki_imamura@fws.gov).

Sincerely,

LORENA WADA Digitally signed by LORENA WADA Date: 2024.11.04 14:22:52 -10'00'

Lorena Wada
Planning and Consultation Team Manager

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

IN REPLY REFER TO
5090
LFE/136-24
8 Oct 24

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

SUBJECT: SECTION 7 FORMAL CONSULTATION FOR MARINE CORPS BASE HAWAII WATER RECLAMATION FACILITY UPGRADES

Dear Mr. Campbell,

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 formal consultation related to the proposed Water Reclamation Facility (WRF) upgrades (Figure 1). The Proposed Action would create a redundant capability through the construction of additional WRF components, which would be adjacent to and integrated with the existing WRF, thereby ensuring treated effluent continues to meet existing permit limitations during planned maintenance events. The new WRF capability would allow existing unit processes to be removed from service for maintenance activities while still maintaining the ability to operate at full capacity. With the proposed upgrades, the new redundant system would provide a parallel redundant water reuse capability, provide disinfection for 100 percent of the effluent treated, and implement tsunami design standards. There is no plan to increase overall discharge levels.

ESA-listed species with the potential to occur at the MCBH Kaneohe Bay WRF are listed in Table 1. Early coordination with the United States (U.S.) Fish and Wildlife Service (USFWS) occurred on June 26, 2023, including a pre-consultation phone conversation between L. Bookless and J. Kwon, regarding the biological assessment and that endangered waterbirds currently forage in and around operational components of the WRF. On August 3, 2023, USFWS conducted a pre-consultation site visit to the MCBH Kaneohe Bay WRF. On August 6, 2024, an additional pre-consultation site visit between D. Christensen and Ryan Pe'a occurred to discuss recent WRF activities and updates to the Proposed Action.

Table 1 Species Included in Biological Assessment Analysis

Common Name	*Scientific Name*	*Hawaiian Name*	*ESA Status*
Hawaiian stilt	*Himantopus mexicanus knudseni*	ʻAeʻo	Endangered
Hawaiian hoary bat	*Aeorestes semotus*	ʻŌpeʻapeʻa	Endangered
Hawaiian petrel	*Pterodroma sandwichensis*	*ʻUaʻu*	Endangered
Newell's shearwater	*Puffinus newelli*	ʻAʻo	Threatened
Hawaii DPS of band-rumped storm petrel	*Hydrobates castro*	ʻAkē ʻakē	Endangered

Legend: DPS = Distinct Population Segment; ESA = Endangered Species Act.

MCBH Kaneohe Bay has determined the proposed construction activities and WRF operations "Will Affect" the Hawaiian stilt. To reduce this impact, avoidance and minimization measures identified in Table 4-1 and described within Section 5.1 of the BA would be required as part of the Proposed Action to help protect stilts and reduce impacts of operating this critical public health and federally mandated facility. MCB Hawaii Kaneohe Bay has evaluated the potential stressors on the Hawaiian hoary bat and seabirds and determined that construction activities and WRF operation impacts may affect but are "Not Likely to Adversely Affect" the bat or seabird populations. MCBH Kaneohe Bay requests concurrence with these determinations.

Please direct correspondence regarding this matter to Lance Bookless, MCBH Senior Natural Resource Manager at lance.bookless1@usmc.mil, (808) 257-7000.

Sincerely,

HART.JEFFRY.P.1242350568 Digitally signed by HART.JEFFRY.P.1242350568 Date: 2024.10.08 18:02:04 -10'00'

J. P. HART
By direction

Enclosure: 1. Biological Assessment of the Proposed MCB Hawaii WRF Upgrades

Appendix E
COASTAL ZONE MANAGEMENT ACT COORDINATION

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From:	Mendes, Debra L
To:	Santos CIV Thomas E
Cc:	Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject:	[Non-DoD Source] Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA
Date:	Wednesday, February 12, 2025 12:03:41 PM

Aloha Thomas Santos,
Thank you for the additional information.

This email acknowledges the U.S. Marine Corps proposed use of the Navy/Marine Corps De Minimis Activities under CZMA list for the proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe, Hawaii. We acknowledge that the activities identified and described should not be subject to further review by the Hawaii CZM Program on the basis and conditions that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions." This acknowledgment does not represent an endorsement of the proposed federal agency activity nor convey approval of any regulations administered by any state or county agency.

Thank you.
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
Email: Debra.L.Mendes@hawaii.gov
~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Santos CIV Thomas E
Sent: Wednesday, February 12, 2025 9:47 AM
To: Mendes, Debra L
Cc: Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject: [EXTERNAL] RE: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Ms. Mendes,

As requested, please see below for a general description of the construction and installation activities associated with the proposed action for this project.

The proposed WRF upgrades include:

- construction of associated sewage treatment facilities
- installation of security fencing
- redundancy upgrade
- tsunami designs
- ability to treat wastewater to reuse quality standards
- supporting improvements – vehicular and pedestrian circulation pavement, vehicular parking, and security fencing and gates
- construction laydown locations outside the WRF

New Facility Construction

The proposed action constructs new operational sewage treatment components and associated support equipment at the WRF at MCB Hawaii Kaneohe Bay. The proposed construction would take place in already developed areas and would be constructed over a 3-year period from Fiscal Year (FY) 2025 through FY 2028. The construction would be done in phases to mitigate disruptions to and maintain operation of the WRF. The associated treatment facilities that would be constructed include an operations/lab/electrical building, a sampler building, a dewatering building, and a blower building. The new facilities would house and safeguard equipment and utility infrastructure while also providing space for operational and laboratory needs. Along with new facility construction, many buildings and structures would be consolidated or removed from the WRF. Construction laydown areas outside the WRF would be used for staging equipment and materials during construction.

Redundancy WRF Upgrade

Proposed WRF upgrades include adding an additional process system to allow unit treatment systems to be taken offline for maintenance or repair without affecting the WRF's ability to meet its permit requirements. By providing integration with the existing treatment system, both systems would have the capability to produce R-1 recycled water.

Utilities

The proposed action would include upgrades to water, sewer, and electrical utilities. The project would incorporate energy-efficient designs, including a sanitary sewer system, gravity and pressure pipelines, and energy-efficient equipment and energy-saving materials in coordination with the Hawaiian Electric Company Energy. New electric feeder cables that utilize an existing conduit will be installed between the WRF and Third Street. There will be trenching between the WRF and Third Street for a new Communication Connection duct bank.

Paving and Site Improvements

Proposed paving and site enhancements include the demolition of existing structures, paving of access roads, landscaping, and installation of fencing. Paving would enhance pedestrian pathways and improve access roads. Additional site improvements would include: constructing retaining walls; installing signage, fountains, handrails, and guardrails; and landscaping of lawns, grasses, and exterior plants.

Parking

An additional five parking spaces would be added outside the new Operations/Laboratory Building.

Tsunami Designs

New facilities constructed as a part of the upgrade to the WRF would meet Risk Category III and Tsunami Risk Category III requirements, resulting in a tsunami design consistent with American Society of Civil Engineers 7-16 Tsunami Geodesign Database. The designed upgrades would account for a maximum tsunami water inundation elevation of 21.3 feet above mean sea level, a peak flow velocity of 20 feet per second, and a future sea level rise of 1.3 feet at the site.

Fencing and Gates

The WRF upgrade includes installation of a perimeter fence enclosure consisting of a 7-foot-tall chain-link fabric fence with a 1-foot-tall single outrigger with barbed wire (8 feet total height).

Please let me know if you have any further questions regarding this project.

Thank you!

V/R

Thomas Santos

NEPA Program Manager
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
Kaneohe Bay, HI
DSN: 315-496-7139
Commercial: 1-808-496-7139
Cell: 808-272-5549
E-mail: Thomas.e.santos.civ@usmc.mil

From: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Sent: Monday, February 10, 2025 2:48 PM
To: Santos CIV Thomas E <thomas.e.santos.civ@usmc.mil>

Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>; LaLonde Capt Ryan David <ryan.d.lalonde.mil@usmc.mil>
Subject: [Non-DoD Source] Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Thomas,
Apologies again.
I have the map you provided back on 1/8/25. Upon receipt of general description of the construction and installation activities we should be able to issue a CZM acknowledgement statement.
thank you,
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
Email: Debra.L.Mendes@hawaii.gov
~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Sent: Monday, February 10, 2025 2:29 PM
To: Santos CIV Thomas E <thomas.e.santos.civ@usmc.mil>
Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>; LaLonde Capt Ryan David <ryan.d.lalonde.mil@usmc.mil>
Subject: Re: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Hello Thomas Santos,
Apologies for the delay in response!

Can you please provide the following for the proposed activities being covered under the De Minimis list:

1. General description of constructions and installation activities
2. Site location map

Thank you,
Debra

~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~
Debra L. Mendes
Hawaii Coastal Zone Management Program
PO Box 2359
Honolulu, HI 96804-2359
Ph: 808.587.2840
Email: Debra.L.Mendes@hawaii.gov
~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~ * ~

From: Santos CIV Thomas E
Sent: Thursday, February 6, 2025 9:40 AM
To: Mendes, Debra L
Cc: Peer Amble; Stephen Wenderoth; Maynard, Ryan M CIV USN (USA); Bomar CIV Jacquelyn C; Hart Maj Jeffry P; Glover CTR Rachel K; LaLonde Capt Ryan David
Subject: [EXTERNAL] RE: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Aloha Ms. Mendes,

Wanted to check on the status of the subject notification and e-mail below that was sent earlier last month to ensure it was received by your office. We are standing by for any questions or RFIs your office may have regarding this notification.

Mahalo!

V/R

Thomas Santos
NEPA Program Manager
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
Kaneohe Bay, HI
DSN: 315-496-7139
Commercial: 1-808-496-7139

Cell: 808-272-5549
E-mail: Thomas.e.santos.civ@usmc.mil

From: Santos CIV Thomas E
Sent: Wednesday, January 8, 2025 7:33 AM
To: Mendes, Debra L <debra.l.mendes@hawaii.gov>
Cc: Peer Amble <Peer.Amble@cardno-gs.com>; Stephen Wenderoth <Stephen.Wenderoth@cardno-gs.com>; Maynard, Ryan M CIV USN (USA) <ryan.m.maynard4.civ@us.navy.mil>; Bomar CIV Jacquelyn C <jacquelyn.bomar@usmc.mil>; Hart Maj Jeffry P <jeffry.hart@usmc.mil>; Glover CTR Rachel K <rachel.glover.ctr@usmc.mil>
Subject: Notification of Proposed Water Reclamation Facility Upgrade at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Navy/Marine Corps De Minimis Activities under CZMA

Aloha Ms. Mendes and Happy New Year,

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 improvements to the existing Water Reclamation Facility (WRF) and install a second (i.e., "redundant") wastewater treatment system.

The purpose of the proposed action is to eliminate noncompliant discharges during planned maintenance events and unscheduled repairs by upgrading the existing infrastructure and constructing a redundant system of similar capacity as the existing WRF, meet water quality and disinfection permit standards, provide new water reuse capabilities on base, and meet tsunami design requirements.

The proposed action would occur at the existing WRF at MCB Hawaii Kaneohe Bay, west of the Main Gate and east of the marina (project location map attached). The facility is adjacent to Kāneʻohe Bay on the southwest and the Salvage Yard wetland on the west. No construction work would take place within the Salvage Yard wetland. Existing support facilities are on the north, and power substation facilities and the main gate on the east.

The proposed action falls within the Navy/Marine Corps De Minimis Activities Under CZMA, Item 1: New Construction, Item 2: Utility Line Activities, Item 3: Repair and Maintenance, Item 10: Studies and Data Collection and Survey Activities, 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 2. Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation,

backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.

Item 3. Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.

Item 10. Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.

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, Utility Line Activities, Repair and Maintenance, Studies and Data Collection and Survey Activities, and Demolition actions are: 1, 2, 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.

2. If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.

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 should 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 shall 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 Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.

14. The National Environmental Policy Act (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 Environmental Assessment (EA).

If you have any questions or would like more information, you can reach me by e-mail at Thomas.e.santos.civ@usmc.mil or by phone at (808) 496-7139.

Mahalo!

V/R

Thomas Santos
NEPA Program Manager
Environmental Compliance and Protection Division
Marine Corps Base Hawaii
Kaneohe Bay, HI
DSN: 315-496-7139
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Cell: 808-272-5549
E-mail: Thomas.e.santos.civ@usmc.mil

LINDA LINGLE
GOVERNOR
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MARK K. ANDERSON
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DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
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Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12644

July 9, 2009

Lieutenant Commander E. J. D'Andrea
Assistant Regional Engineer
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brian Yamada

Dear Lt. Commander D'Andrea:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Concurrence with Modifications to the Department of the Navy De Minimis Activities in Hawaii under the Coastal Zone Management Act (CZMA)

The Hawaii CZM Program has completed the federal consistency review of the proposed modifications to the list of Department of the Navy de minimis activities under the CZMA, including changes to various activity categories, adding new activity categories, and expanding the coverage to Marine Corps Base Hawaii Kaneohe Bay and Camp Smith. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control's publication, *The Environmental Notice*, on June 23, 2009. The public was provided an opportunity to participate in the review through July 7, 2009. There were no public comments received.

We concur that the activities identified on the modified list entitled, "Navy/Marine Corps De Minimis Activities Under CZMA" are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects, and should not be subject to further review by the Hawaii CZM Program on the basis and condition that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions."

The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the "Navy/Marine Corps De Minimis Activities Under CZMA" list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency

concurrence does not convey approval with any other regulations administered by any State or County agency.

Modifying and expanding the list of Navy de minimis activities under the CZMA was a cooperative effort between our Office and Mr. Brian Yamada from the Department of the Navy, who interned with the Hawaii CZM Program in September 2008. We appreciate the efforts of Mr. Yamada in working with our CZM staff. The de minimis activities list will result in more efficient compliance with CZMA federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch (w/ copy of de minimis list)
Ms. Rebecca Hommon, Region Counsel, Navy Region Hawaii

DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-5101

5090
Ser N4/ 04163
01 JUN 2009

CERTIFIED MAIL NO. 7007 2560 0002 0326 9580

Mr. Abbey Mayer
Office of Planning
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu HI 96804

Dear Mr. Mayer:

SUBJECT: REQUEST FOR CONCURRENCE WITH MODIFICATIONS TO THE DEPARTMENT OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy/Marine Corps de minimis activities under the CZMA. The attached de minimis list will amend the current de minimis list which was established on April 2, 2007. The new de minimis list will include the Marine Corps, and will cover areas in the Pearl Harbor Naval complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station Pacific, Pacific Missile Range Facility on Kauai, Kaneohe Marine Corps Base Hawaii, Camp Smith and all associated installations/facilities/equipment located outside of those Navy/Marine Corps properties.

The Navy and Marine Corps have determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR part 930.33 (3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brian Yamada at 472-1449, by facsimile transmission at 474-5419, or by email at brian.yamada@navy.mil.

Sincerely,

E. J. D'ANDREA
Lieutenant Commander, CEC, U. S. Navy
Assistant Regional Engineer
By direction of the
Commander

Enclosure: 1.Navy De minimis Activities Under CZMA

Navy/Marine Corps De Minimis Activities Under CZMA

***covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties**

No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	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.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeting and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingrants/outgrants and/or 50 acres or more where existing land use will change.	14, 16

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14	Mission Changes	Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.	14, 16
15	Limitation of Access to Property	Permanent closure or limitation of access to any areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.)	14, 16
16	Environmental Management Activities	Environmental management activities within Navy/Marine Corps controlled areas including, but not limited to, activities such as vegetation and mangrove removal, ditch clearing, sediment removal, invasive species removal, construction related to protecting endangered species and wildlife, and actions prescribed by the Integrated Natural Resources Management Plan (INRMP)	2, 13, 14, 16
17	Towers	Installation, operation, and maintenance of towers (such as communication towers, cellular phone antennas, wind-energy towers) within Navy/Marine Corps controlled areas.	1, 2, 6, 8,9 , 12, 13, 14, 16
18	Alternative Energy Research	Installation, operation, replacement, and removal of alternative energy research structures/equipment taking place within Navy/Marine Corps controlled areas.	1, 2, 3, 5, 6, 12, 13, 14, 16
19	Army Corps Nation Wide Permits	Work subject to an Army Corps of Engineers Nationwide permit (which are applicable to Hawaii)	16

Project Mitigation / General Conditions

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.
2) If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
3) Turbidity and siltation from project related work shall 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.
4) Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
5) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
6) No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
7) All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
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 should 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 shall 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, hyrdroseeding, 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 Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
14) The National Environmental Policy Act (NEPA) review process will be completed.
15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
16) Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA). Notification can be sent via email: to JNakagaw@dbedt.hawaii.gov

Appendix F
AIR EMISSIONS CALCULATIONS

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F.1 Construction Activity Inputs

Construction activities associated with the Water Reclamation Facility (WRF) Upgrade at Marine Corps Base Hawaii (MCBH) Kaneohe Bay in O'ahu, Hawai'i would involve demolition of existing structures, construction of new buildings for various uses, installation of resiliency structures to elevate certain equipment above tsunami inundation levels, installation of new wastewater treatment processes and utilities, fencing, pavement, and other site improvements.

A construction estimate to identify equipment, material, and manpower requirements for the construction activities associated with the proposed action as to construction crew and equipment requirements and productivity was performed based on data presented in:

"2003 RSMeans Facilities Construction Cost Data", R.S. Means Co., Inc., 2002
"2011 RSMeans Facilities Construction Cost Data", R.S. Means Co., Inc., 2010

The assumptions and calculations are based on the program cost estimates developed for the work that roughly quantify the major components of the work.

Some portions of the work are considered incidental or as not generally accretive to equipment use and emissions. For example, erosion control and fence removal are expected to be relatively low-intensity low-frequency work items. Additionally, because no subgrade construction is noted in the project descriptions and the site is and will remain generally flat, it is assumed that no mass grading activities are required (other than excavation necessary specifically to construction building foundation elements).

The construction phases considered with manpower and equipment estimates include:

- One building demolition
- Structure construction
  - Four new facility buildings that would involve construction of foundation, enclosure, mechanical system, finishes, and interior utility installations
  - Tsunami design with 7,803 feet of concrete structure to elevate various systems above inundation levels
  - Redundancy WRF Upgrades, including constructing a primary clarifier, equalization tank, moving biofilm reactor, and storage tanks
  - Utilities
  - Parking and site improvement
- Utility trenching

F.2 Equipment Operations and Emissions

The quantity and type of equipment estimated using RSMeans methods for the activities necessary to implement the proposed action as described above are inputs for further quantification of air emissions. All equipment was assumed to be diesel-powered. For the equipment without a specified horsepower rating per RSMeans, the average level for the similar equipment types were applied using the United States (U.S.) Army Corps of Engineers construction equipment database.

Estimates of equipment emissions were based on the estimated hours of usage and emission factors for each mobile source for the project. Emission factors related to diesel nonroad equipment were estimated from U.S. Environmental Protection Agency's (EPA's) Motor Vehicle Emission Simulator

(MOVES). The national default input parameters applicable for Honolulu County where the proposed project is located were used in emissions factor modeling.

The EPA recommends the following formula to calculate hourly emissions from nonroad engine sources:

$$M_i = N \times HP \times LF \times EF_i$$

Where:

M_i = mass of emissions of i^{th} pollutants during inventory period;
N = source population (units);
HP = average rated horsepower;
LF = typical load factor; and
EF_i = average emissions of i^{th} pollutant per unit of use (e.g., grams per horsepower-hour).

Typical load factors for various equipment types will be based on Appendix A of EPA's "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling" (EPA, 2010).

The estimated construction equipment emissions are summarized in Table F-1.

F.3 Vehicle Operations and Emissions

The quantity and trips of construction commuter vehicles and material hauling trucks were estimated based on the projected manpower and material required for demolition and construction activities estimated using RSMeans method.

Truck and commuting vehicle operations would result in indirect emissions. The MOVES4 motor vehicle emission simulator version was used to predict truck and commuter vehicle running emission factors. As stated earlier, projected vehicle operations were based on RSMeans trip forecasts and assumed average travel distance for each truck and commuting vehicle trip off site. The estimated vehicle trips resulting emissions are summarized in Table F-2, including MOVES emission factors, and annual travel distances in miles.

F.4 Fugitive Dust (Earth Disturbance)

In addition to engine emissions, fugitive dust emissions resulting from earth disturbance (e.g., excavation and transferring of excavated materials into dump trucks) were estimated with particulate emission factors from the Wrap Fugitive Dust Handbook (Western Regional Air Partnership, 2006). The particulate matter (PM) emission factors are the following:

PM_{10} = 0.11 (tons/acre-month)
$PM_{2.5}$ = PM_{10} emission factor × ratio [0.1 for construction and demolition activity]

PM emissions were calculated using the following equation:

$$E = EF \times \text{acres} \times \text{months of activity}$$

Where:

E = fugitive dust emissions (tons)
EF = emission factor (ton/acre-month)

The amount of earth disturbed was based on square footage of land disturbed by new or modified buildings, other impervious surfaces, and other ground disturbances as summarized in Table 2.2-1 of the environmental assessment (EA). Estimated fugitive dust emissions for PM_{10} and $PM_{2.5}$ are shown in Table F-3.

F.5 Combined Construction Emissions

The estimated total annual construction emissions during the 3-year construction duration are summarized in Table F-4.

Table F-1. Total Construction Equipment Emissions

Equipment	HP	Days	Hours	Load Factor	Emission Factor (g/hp-hr)							Emissions (tons)						
					CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_{2e}	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
Backhoe loader, 48hp	48	116	928	0.59	0.420	0.002	0.050	0.051	2.628	0.117	697.97	0.012	0.000	0.001	0.001	0.076	0.003	20.22
Backhoe loader w/ attachment	48	2	16	0.43	0.420	0.002	0.050	0.051	2.628	0.117	697.97	0.000	0.000	0.000	0.000	0.001	0.000	0.25
Compressor, 250 cfm	74	9	72	0.43	0.438	0.002	0.052	0.054	2.767	0.092	591.95	0.001	0.000	0.000	0.000	0.007	0.000	1.49
Compressor, 600 cfm	122	54	432	0.43	0.156	0.001	0.037	0.039	0.656	0.038	531.43	0.004	0.000	0.001	0.001	0.016	0.001	13.28
Concrete pump, small	425	52	416	0.43	0.575	0.002	0.085	0.088	2.065	0.126	531.81	0.048	0.000	0.007	0.007	0.173	0.011	44.57
Crane, 80-ton	402	46	368	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.011	0.000	0.002	0.002	0.049	0.003	37.26
Crane, 90-ton	450	66	528	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.018	0.000	0.003	0.003	0.078	0.004	59.84
Crane, hydraulic, 12 ton	240	120	960	0.43	0.061	0.001	0.013	0.014	0.257	0.019	531.21	0.007	0.000	0.001	0.002	0.028	0.002	58.01
Crane, hydraulic, 33 ton	350	1	8	0.43	0.161	0.001	0.026	0.027	0.694	0.037	531.38	0.000	0.000	0.000	0.000	0.001	0.000	0.71
Crane, SP, 12 ton	74	6	48	0.43	0.284	0.002	0.028	0.029	2.620	0.065	591.80	0.000	0.000	0.000	0.000	0.004	0.000	1.00
Crane, SP, 5 ton	51	20	160	0.43	0.284	0.002	0.028	0.029	2.620	0.065	591.80	0.001	0.000	0.000	0.000	0.010	0.000	2.29
Crawler-type drill, 4"	225	54	432	0.59	0.045	0.001	0.011	0.011	0.180	0.013	536.92	0.003	0.000	0.001	0.001	0.011	0.001	33.94
Diesel hammer, 41k ft-lb	164	63	504	0.43	0.498	0.002	0.115	0.119	2.217	0.181	532.45	0.020	0.000	0.005	0.005	0.087	0.007	20.86
Dozer, 300 HP	300	7	56	0.59	0.045	0.001	0.011	0.011	0.180	0.013	536.92	0.000	0.000	0.000	0.000	0.002	0.000	5.87
Dump truck, 16-ton	286	2	16	0.59	0.019	0.001	0.006	0.006	0.112	0.010	536.86	0.000	0.000	0.000	0.000	0.000	0.000	1.60
Front end loader, 1.5 cy, crl	118	7	56	0.21	0.585	0.002	0.121	0.125	1.273	0.186	627.97	0.001	0.000	0.000	0.000	0.002	0.000	0.96
Front end loader, TM, 2.5cy	177	1	8	0.21	0.508	0.002	0.096	0.099	1.110	0.172	627.83	0.000	0.000	0.000	0.000	0.000	0.000	0.21
Gas engine vibrator	5.4	87	696	0.59	2.461	0.002	0.232	0.239	4.183	0.838	605.63	0.006	0.000	0.001	0.001	0.010	0.002	1.48
Gas welding machine	24.8	112	896	0.21	2.381	0.003	0.276	0.284	4.062	0.560	700.21	0.012	0.000	0.001	0.001	0.021	0.003	3.60
Grader, 30,000 lb	150	34	272	0.59	0.075	0.001	0.017	0.018	0.272	0.012	536.95	0.002	0.000	0.000	0.000	0.007	0.000	14.25
Hydraulic excavator, 3.5 cy	424	26	208	0.59	0.088	0.001	0.017	0.018	0.259	0.018	536.98	0.005	0.000	0.001	0.001	0.015	0.001	30.80

Equipment	HP	Days	Hours	Load Factor	Emission Factor (g/hp-hr)							Emissions (tons)						
					CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
Rammer/Tamper, 8"	4	11	88	0.59	2.552	0.002	0.250	0.258	4.224	0.837	599.62	0.001	0.000	0.000	0.000	0.001	0.000	0.14
Roller, vibratory	114	7	56	0.59	0.120	0.001	0.029	0.030	0.388	0.018	537.03	0.000	0.000	0.000	0.000	0.002	0.000	2.23
Tandem roller, 10 ton	114	110	880	0.59	0.120	0.001	0.029	0.030	0.388	0.018	537.03	0.008	0.000	0.002	0.002	0.025	0.001	35.04
Tractor truck, 240 HP	240	107	856	0.59	0.054	0.001	0.012	0.013	0.204	0.015	536.95	0.007	0.000	0.002	0.002	0.027	0.002	71.74
Light Truck	325	20	160	0.59	0.174	0.001	0.028	0.029	0.492	0.029	537.10	0.006	0.000	0.001	0.001	0.017	0.001	18.16
Water tank truck, 5000 gal	407	7	56	0.59	0.031	0.001	0.008	0.008	0.137	0.011	536.88	0.000	0.000	0.000	0.000	0.002	0.000	7.96
											Total:	0.175	0.001	0.030	0.031	0.674	0.044	487.75

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; g/hp-hr = grams per horsepower-hour; HP = horsepower; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

Table F-2. Total Construction On-Road Vehicle Emissions

Vehicle Type	Fuel Type	Road Type	Speed	Distance Driven	Crew Days of Use	Driving Emissions (g/mile)							Driving Emissions (tons)						
						CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
Passenger Truck	Gasoline	Urban Unrestricted	25	5	6778	3.848	0.002	0.009	0.046	0.194	0.065	457.89	0.144	0.000	0.000	0.002	0.007	0.002	17.11
Passenger Truck	Gasoline	Urban Restricted	55	15	6778	3.501	0.002	0.008	0.043	0.155	0.054	430.38	0.392	0.000	0.001	0.005	0.017	0.006	48.23
Single Unit Short Haul Truck	Diesel	Urban Unrestricted	25	5	2012	1.862	0.003	0.222	0.328	4.370	0.453	1071.82	0.021	0.000	0.002	0.004	0.048	0.005	11.89
Single Unit Short Haul Truck	Diesel	Urban Restricted	55	15	2012	1.862	0.003	0.222	0.328	4.370	0.453	1071.82	0.062	0.000	0.007	0.011	0.145	0.015	35.66

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; g= gram; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

Table F-3. Fugitive Dust Emissions

Conversions	
0.1	$PM_{2.5}/PM_{10}$ [fugitives]
0.11	PM_{10} tons/acre-month [fugitives]
1.142007	Assumption – Total disturbance areas are evenly divided over 3 construction years.
Monthly	
0.125621	PM_{10} tons / month
0.012562	$PM_{2.5}$ tons / month
Yearly	
1.507449	PM_{10} tons / year
0.150745	$PM_{2.5}$ tons / year

2026 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924
2027 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924
2028 Emissions (Tons)	
PM_{10}	1.50744924
$PM_{2.5}$	0.150744924

Legend: $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter.

Table F-4. Combined Annual Construction Emissions

Emission Type	Emissions (tons)						
	CO	SO_x	$PM_{2.5}$	PM_{10}	NO_X	VOC	CO_2e
	2026						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21
	2027						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21
	2028						
On Road	0.206	0.000	0.004	0.007	0.073	0.010	37.63
Off Road	0.058	0.000	0.010	0.010	0.225	0.015	162.58
Fugitive Dust			0.151	1.507			
Total	0.265	0.001	0.164	1.525	0.297	0.024	200.21

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

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