

**Appendix C: Environmental Appendix
Waiakea-Palai Flood Risk Management,
Hilo, Island of Hawaii, Hawaii**

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LIST OF ACRONYMS

ACE	Annual Chance Exceedance
ASYA	Aquifer System Area
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Emergency Response, Compensation, and Liability Information System
cfs	cubic feet per second
CORRACTS	Corrective Action Reports
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	Decibels
dBA	A-weighted sound level
DFIRM	Digital Flood Insurance Rate Map
DNL	Day-night Sound Level
DLNR	Department of Land and Natural resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FRM	Flood Risk Management
FWCA	Fish and Wildlife Coordination Act
FWP	Future with Project
FWOP	Future without Project
ft	foot or feet
GHG	Greenhouse Gas
HCCS	Hawai'i Comprehensive Conservation Strategy
HRS	Hawai'i Revised Statute
HSDOH	Hawai'i State Department of Health
HTRW	Hazardous, Toxic, and Radioactive Waste
HUD	Housing and Urban Development
IFR/EA	Integrated Feasibility Report/Environmental Assessment
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MMPA	Marine Mammal Protection Act
MSFCMA	Magnuson-Stevens Fisheries Conservation and Management Act
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OEQC	Office of Environmental Quality Control
OHWM	Ordinary High Water Mark
ORMP	Ocean Resource Management Plan
OSHA	Occupational Safety and Health Administration
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RSLR	Relative Sea Level Rise
SHPO	State Historic Preservation Officer
SLR	Sea Level Rise
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TSD	Treatment, Storage, or Disposal
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
WOTUS	Waters of the U.S.

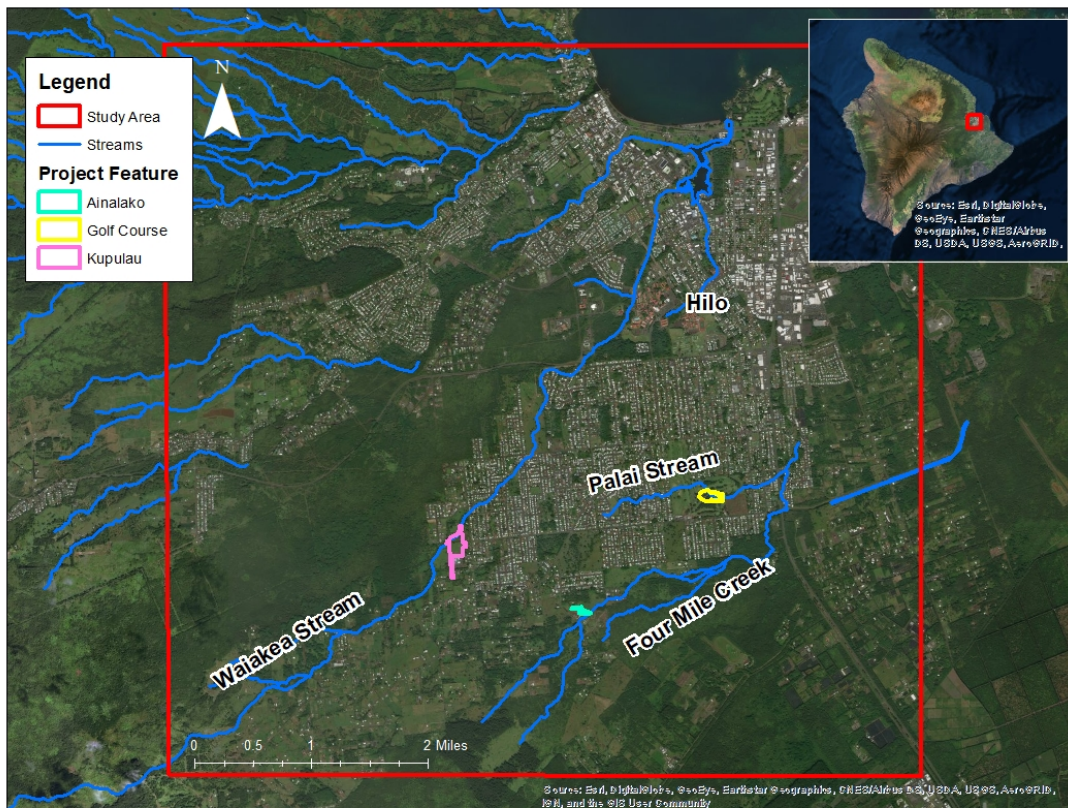
1 INTRODUCTION

The U.S. Army Corps of Engineers, Honolulu District (USACE), in partnership with the County of Hawai'i Department of Public Works, is assessing the reduction of flood risk in the Waiakea and Palai Streams near Hilo, Hawai'i. The study is authorized under Section 205 of the Flood Control Act of 1948, as amended (33 U.S.C. 701s; Public Law 93-251, as amended; Public Laws 97-140 and 99-662). This environmental appendix supplements the Waiakea-Palai Integrated Feasibility Report/Environmental Assessment (IFR/EA) in compliance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality (CEQ) regulations 40 CFR 1500-1508 and incorporates the requirements of the Hawai'i Revised Statutes (HRS) and the Hawai'i State Office of Environmental Quality Control (OEQC). This Integrated Feasibility Report and Environmental Assessment was developed under the NEPA rules of 1978. All analysis, coordination, consultations, as well as outreach was complete prior to the implementation of the new NEPA rules effective September 14, 2020. The IFR/EA meets the appropriate State filing and notification requirements, as applicable.

2 STUDY AREA

The study area encompasses the Waiakea and Palai watersheds near the town of Hilo, Hawai'i, located on the northeastern coast of the island of Hawai'i (**Figure 1**). The Waiakea Stream, Palai Stream, and Four Mile Creek are three of the five tributaries within the principal Wailoa River System, which drains a total of 178 square miles and empties into Hilo Bay.

Figure 1: Waiakea-Palai Stream Study Area



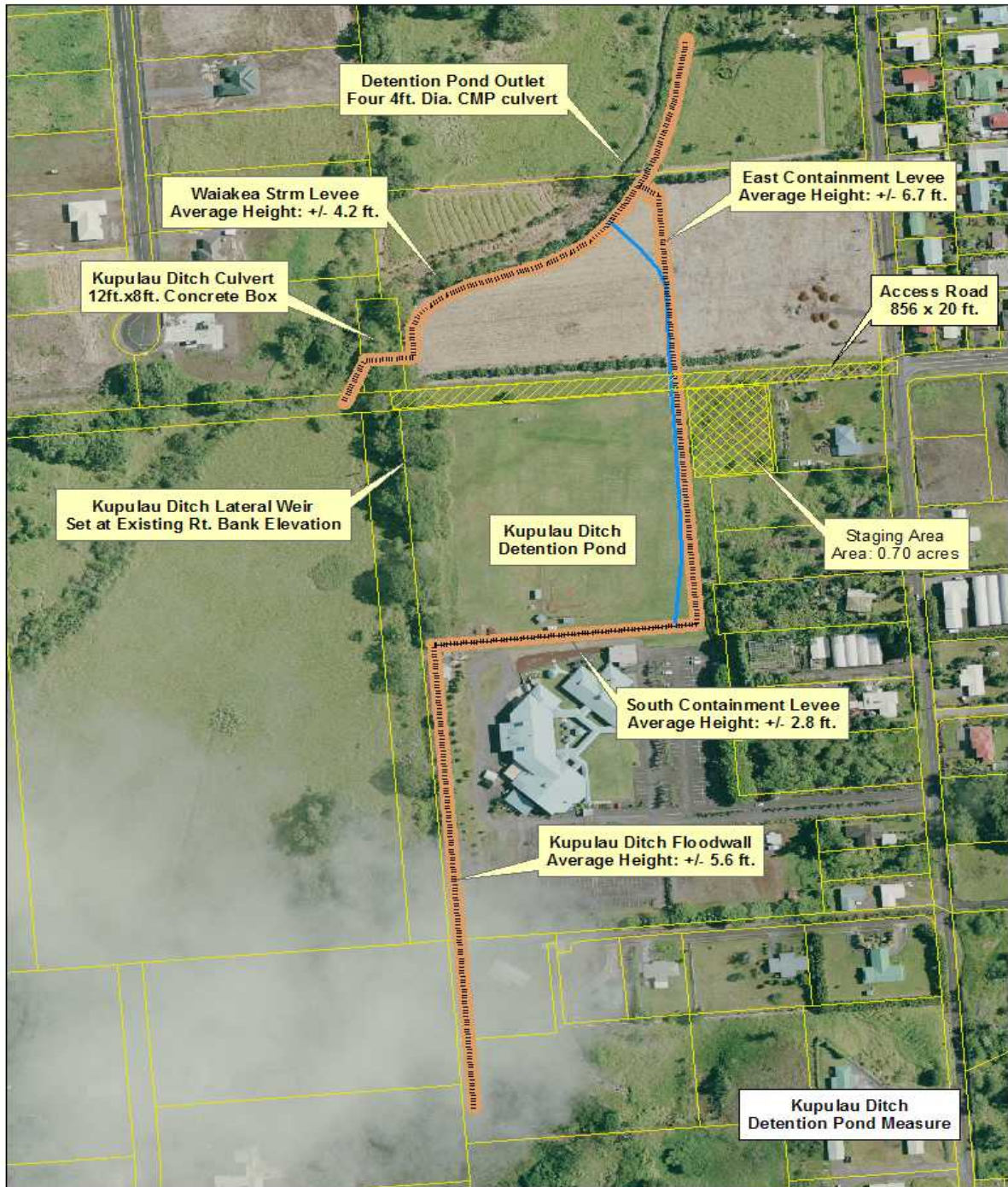
3 FLOOD RISK MANAGEMENT ALTERNATIVES

The objective of the feasibility study is to identify measures to reduce the flood risk associated with the Waiakea and Palai Streams in the City of Hilo. The proposed final array of alternatives consist of two stand-alone alternative measures (Kupulau Ditch Levee/Floodwall and Hilo Municipal Golf Course Detention) and an alternative combining both of these FRM features. The location of the each of the FRM project areas is provided in *Figure 1*.

3.1 KUPULAU DITCH

The Kupulau Ditch Alternative includes the construction of a detention basin on property located to the north of the New Hope Church and adjacent to the right bank of Kupulau Ditch (located east of the confluence of Kupulau Ditch and Waiakea Stream)(**Figure 2**). Impounding the runoff would be accomplished by constructing a series of three levees and one floodwall to enclose the landscape by utilizing the natural topography of the area.

Figure 2: Kupulau Ditch Alternative



3.2 HILO MUNICIPAL GOLF COURSE DETENTION

The golf course alternative includes the construction of a detention basin in the Hilo Municipal Golf Course to attenuate flow and reduce damage to properties in the downstream reaches of Palai Stream (**Figure 3**). A 21 acre-foot detention pond would be constructed at the Hilo Municipal Golf Course to capture flood

flows with an outlet structure designed to release flow to minimize flood damage to downstream property.

Figure 3: Hilo Municipal Golf Course Detention



This environmental appendix addresses the natural and social resources in the study area and the impacts to these resources resulting in the construction and operation of the flood risk management alternatives.

4 EXISTING CONDITIONS

The following section describes the existing conditions of the study area. This analysis established a baseline, or existing condition, to provide a frame of reference to evaluate the performance of alternative plans.

4.1 LAND USE

The upper reaches of the Waiakea and Palai Stream watershed consist of pastoral land uses such as cropland, pastures, shrub rangeland, and evergreen forest. Continuing into the Hilo town limits, residential land uses increase in density and generally transition into commercial and industrial uses towards the coastline.

4.2 CLIMATE

The region has a tropical climate with mild temperatures throughout the year, moderate humidity, persistent northeasterly trade winds, significant differences in rainfall within short distances, and infrequent severe storms. The climate is dominated by the northeast trade winds blowing against the slopes of Mauna Loa. Orographic rainfall caused by lifting and cooling of moisture-laden air masses, is highest in a north-south trending zone on the eastern slope of Mauna Loa between altitudes of 2,000 and 4,000 feet. The annual temperature within the study area averages 72 °F with little variation in summer and winter air temperatures. The annual rainfall in the study area ranges from 143 inches a year in the town of Hilo and up to 200 inches a year in the upper reaches of the watershed (University of Hawai'i at Mānoa, 2019). Peak rainfall events occur in the spring and early winter. The monthly average high precipitation in the town of Hilo is 17 inches in November and the monthly average low occurs in June with 2 inches of precipitation. In the upper reaches of the watershed, winter also results in higher precipitation with a monthly high in March of 22 inches and a low of 13 inches in February.

4.3 WATER RESOURCES

Water resources include both surface water and groundwater resources, associated water quality, and floodplains. Surface water includes all lakes, ponds, rivers, streams, impoundments, wetlands and estuaries within the watershed. Subsurface water, commonly referred to as ground water, is typically found in certain areas known as aquifers. Aquifers are areas with high porosity rock where water can be stored within pore spaces. Water quality describes the chemical and physical composition of water affected by natural conditions and human activities.

4.3.1 HYDROLOGY AND HYDRAULICS

Waiakea Stream, Palai Stream, and Four Mile Creek are tributaries of the Wailoa River system. The Waiakea and Palai Streams drain into the Waiakea Pond, which is contiguous with Hilo Bay and the Pacific Ocean.

At the upstream end of the study area, Waiakea Stream contains a poorly defined channel. When the stream overflows, floodwaters travel east to enter the Kupulau Ditch. The channel bed is composed of lava rock and the overbanks are highly vegetated. The high velocities dislodge rock and vegetation and transport the material downstream.

Kupulau Ditch was built in 1971 to divert water from the Palai watershed into the Waiakea Stream in order to reduce flood problems. The ditch is approximately 3,500 in length, has an average depth of

seven feet, has a bed slope of 0.006 foot per foot (ft/ft), and is composed of lava rock. The 10 percent annual chance exceedance (ACE) flows for Kupulau Ditch is 430 cubic feet per second (cfs) and the ditch conveys 904 cfs during a one-percent event. Kupulau Ditch receives overflow from Waieka Stream and quickly reaches its capacity. The ditch begins to overflow over its right bank and flood the New Hope Church, which is located adjacent to the ditch. The water then backs up across Kupulau Road and flows overland in an eastward direction flooding structures along HaiHai Street and Ainalako Road.

Floodwater from the overtopping Kupulau Ditch enters the Palai Stream at the Hilo Municipal Golf Course before continuing downstream to industrial, commercial, and residential areas within the Town of Hilo. The channel capacity of Palai Stream is about 1,000 cfs, equivalent to a 20 percent ACE flood from the Hilo Municipal Golf Course downstream to Kawaihine Street. The bed slope of this reach of Palai Stream is 0.026 ft/ft and flattens to a slope of 0.006 ft/ft downstream of Kawaihine Street. Downstream of Kawaihine Street the channel capacity reduces to approximately 800 cfs which is the equivalent of a 50 percent ACE flood. Once leaving the banks, floodwaters in this reach of the Palai Stream are conveyed by overland flow. Stream channels in this area are poorly defined with low lying areas serving as pockets of storage areas.

4.3.2 FLOODPLAINS

Federal Emergency Management Agency (FEMA) National Flood Insurance Maps were used to delineate the 100-year floodplains for the study area (FEMA, 2019). Additional Hydrology and Hydraulic models further refined the areas inundated at various ACEs, including the 0.01 ACE. The FEMA Flood Maps delineate the watershed using different zone designations associated with the probability of flooding frequency for that area. The study area contains six different zone designations:

- A and AE – Areas subject to inundation by the one percent ACE,
- AO – Areas subject to inundation by the one percent ACE shallow flooding, usually sheet flow on sloping terrain) where average depths are between one and three feet,
- AH – Areas subject to inundation by the one percent ACE shallow flooding, usually areas of ponding) where average depths are between one and three feet,
- VE – Areas subject to inundation by the one percent ACE with additional hazards due to storm-induced velocity wave action
- X – Areas outside of the 0.2 percent floodplain
- NP – Areas not mapped by the FEMA National Flood Insurance Program.

The floodplains associated with Waiakea Stream, Palai Stream, and Four Mile Creek follow the stream course in a relatively narrow corridor, with areas of shallow sheet flow flooding (AO and AH) extending the floodplain out into the adjacent areas. FEMA has designated the Waiakea floodplains as A, AE, AH, and AO indicating the Waiakea widens out of its banks during the one percent ACE and the storm also induces shallow sheet flow inundation into areas outside of the channel. Similarly, FEMA has designated the Palai floodplain as AE and AO. However, FEMA designates the Four Mile Creek floodplain as AH indicating that much of the one percent flooding along the Creek is due to sheet flow. Finally, areas along the coastline of the study area have been designated as VE zones transitioning into AE farther inland.

4.4 WETLANDS

Wetlands are often defined as areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system. Wetland areas require specific hydrology, soil types (i.e. hydric soils), and plant species that are characterized as requiring wetland habitats.

The U.S. Fish and Wildlife Service (USFWS)(2019) has mapped wetlands within the study area as part of the National Wetlands Inventory (NWI). Although the USFWS have identified several errors in the national NWI, the database provides a good baseline prior to field identification.

Within the Waiakea-Palai watershed, the NWI identifies five freshwater ponds (three PUBHh, one PUBH, and one PUBHx); however, these ponds are 1,600 to 5,700 feet from the floodplains of the streams. The first letter of the NWI designation refers to the Palustrine hydrology of the wetland. The rest of the designation refers to an unconsolidated bottom (UB), permanently flooded (H), diked or impounded (h), or excavated (x). The NWI characterizes Waiakea Pond as an Estuary (E1UBL). For estuarine systems, the first letter of the wetland designation refers to the subtidal estuarine (E1) hydrology of the wetland. Waiakea pond has an unconsolidated bottom (UB) and is subtidal (L). According to the NWI, no riverine or palustrine wetlands occur along the streams.

4.5 SURFACE WATERS

The Clean Water Act (CWA)(33 U.S.C §§1251 *et seq.*) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. For the purposes of Clean Water Act regulatory jurisdiction, the term Waters of the U.S. is defined at 33 CFR 328.3(a). Waters of the U.S. include all tributaries to those waters currently or previously used or susceptible for interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide. Three main waterways occur within the project areas, the Waiakea Stream, Kupulau Ditch and Palai Stream. Both Waiakea and Palai streams feature intermittent flow while the Kupulau Ditch conveys ephemeral flow.

The Waiakea Stream is a tributary to a navigable water, conveying continuous surface connectivity to Hilo Bay and as such, is a water of the U.S. The Waiakea Stream flows intermittently in the project area and perennially downstream prior to confluence with a navigable water.

The Kupulau Ditch was artificially-constructed in uplands to convey stormwater flows to the downstream Waiakea Stream, flowing only in response to precipitation events,. The Kupulau Ditch conveys ephemeral flow downstream to the Waiakea Stream and features a trapezoidal channel constructed of earthen bed and banks. Under the Navigable Waters Protection Rule, the Kupulau Ditch is not a water of the U.S. e.g. “non-jurisdictional”.

The Palai Stream bifurcates the Hilo Municipal Golf Course. The Palai Stream channel and banks are defined within the project areas. However, based on a site visit attended by USFWS in February 2019, the Corps confirmed that flow within the Palai Stream, downstream of the Golf Course at the intersection of Mamalahoa Highway and Puainako Street, eventually vanishes into swales and storm water conduits. The tributary lacks continuous surface connectivity to a navigable water and according to the Navigable Waters Protection Rule, is not a water of the U.S. e.g. “non-jurisdictional”.

During storms, storm water runoff from the steep watershed of the streams results in high energy flows by the time it reaches the study area. Some runoff may quickly seep into the ground depending on

subsurface permeability where flows continue subsurface. Storm water runoff can also disappear into lava tubes and reappear as surface flow downstream. The movement of subsurface flow is unknown and may or may not affect peak storm water flows (USDA, 2009).

4.5.1 WAIAKEA STREAM

Waiakea Stream originates along the northeastern slopes of Mauna Loa volcano (elevation 13,653 feet) and has a drainage area of 35.6 square miles. Waiakea Stream flows northeast through the residential community of upper Waiakea-Uka Homesteads before entering the town of Hilo and ultimately emptying into Waiakea Pond and Hilo Bay. The stream is intermittent due to the highly permeable volcanic substrate. During storms, storm water runoff returns flow to the streams. Due to the steep nature of the watershed, the stream flow has high energy and is turbulent. Some of the stormwater runoff eventually seeps in to the ground, continues as subsurface flow, or flows into lava tubes and reappears as springs.

Portions of the Waiakea Stream within the study area have been previously altered to reduce flood risk in the Hilo area. In 1965, USACE built a flood control project that extends from the lower reaches of Waiakea Stream to Waiakea Pond. This project, called the Wailoa Stream Flood Control Project, consists of channel improvements and levees to provide flood protection for an area of Hilo downstream of the University of Hawai'i at Hilo. The project was designed for a discharge of 6,500 cubic feet per second (cfs) and at the date of completion provided a 0.008% ACE.

In 1971, the County of Hawai'i constructed Kupulau Ditch. This ditch diverted storm water runoff from to the Waiakea Stream upstream of Kupulau Road. The ditch consists of a trapezoidal channel about 3,500 linear feet long with a 12-foot bottom width and 2:1 slopes.

Upstream, the County of Hawai'i constructed the Waiakea-Uka channel in 1984. This channel consists of 3,460 linear feet of concrete lined and unlined trapezoidal channel improvements from Kawailani Street to the intersection of Komohana and Puainako Streets. These improvements were designed for a discharge of 4,460 cfs. Farther upstream, the County of Hawai'i replaced the Kawailani Street Bridge with a new bridge having a larger opening and improved the channel upstream and downstream of the bridge. These bridge and channel improvements were completed in November 2000.

4.5.2 PALAI STREAM

Palai Stream has a drainage area of about 7.7 square miles and is classified as an intermittent stream. Its watershed is linearly shaped and approximately 11 miles in length and about 2 miles in width at its widest point. Palai Stream originates down slope of the broad saddle formed between Mauna Loa and Mauna Kea volcanos and flows for about 7 miles through the Waiakea Forest Reserve with elevations ranging from 2,100 to 1,500 feet. The watershed is largely developed below the 1,500-foot elevation. It flows an additional four miles through the Town of Hilo before emptying into Waiakea Pond and Hilo Bay. There are no federal flood risk management (FRM) projects located in the Palai watershed.

4.6 GROUND WATER

The study area is underlain with the Hilo and Keaau Aquifer System Area (ASYA) of the Northeast Mauna Loa Aquifer Sector Area. Water in the study area aquifer occurs as a lens of basal water floating on saline groundwater (Takasaki, 1993). The aquifer is unconfined and occurs in basalt originating from flank lava flows. The aquifer is designated as a drinking water source, is irreplaceable, and is highly

vulnerable to contamination (Mink and Lau, 1990). Wells in the study area indicate that the depth to groundwater is estimated to be greater than 100 feet. The sustainable yield of the Hilo ASYA is 347 million gallons per day (mgd) and the Keaau ASYA provides a yield of 393 mgd. The combined ASYAs provide the highest yield of all the sector areas on the island. The watersheds associated with Mauna Loa slope contributes 50 to 100 inches per year of groundwater recharge. The aquifer provides water resources for municipal, agricultural, and industrial uses in the Hilo area.

4.7 COASTAL ZONE MANAGEMENT RESOURCES

In 1972, Congress passed the Coastal Zone Management Act (CZMA), which established the federal Coastal Zone Management Program (CZMP; Public Law 92-583 Stat.1280, 16 §§ 1451-1464, Chapter 33). The CZMP is a federal-state partnership that provides a basis for protecting, restoring, and responsibly developing coastal resources. The CZMA defines coastal zones wherein development must be managed to protect areas of natural resources unique to coastal regions. Hawai'i has developed and enacted the Hawai'i Ocean Resources Management Plan (ORMP), in which any federal and local actions must be determined to be consistent with the management plan. The State of Hawai'i Office of Planning enforces consistency of the plan for Hawai'i.

States are required to define the area that will comprise their coastal zone and develop management plans that protect the unique resources through enforceable policies of the State ORMP. Hawai'i defines its coastal zone as all lands of the state and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea. Therefore, the study area lies within the coastal zone as defined by the State.

The ORMP goals and policies focus management efforts on 11 management priority groups:

- Appropriate Coastal Development
- Management of Coastal Hazards
- Watershed Management
- Marine Resources
- Coral Reef
- Ocean Economy
- Cultural Heritage of the Ocean
- Training, Education, and Awareness
- Collaboration and Conflict Resolution
- Community and Place-based Ocean Management Projects
- National Ocean Policy and Pacific Regional Objectives

4.8 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide. The Clean Air Act (42 U.S.C. 7401 *et seq.*), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment.

EPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less

than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). If the concentration of one or more criteria pollutants in a geographic area is found to exceed the regulated “threshold” level, the area may be classified as a non-attainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered in attainment.

There are no non-attainment areas within the State of Hawai‘i (EPA, 2019a).

An air quality monitoring station is located within the study area at 1099 Waianuenue Avenue near the Hilo Medical Center. The prevailing trade winds on Hawai‘i Island are from the east-northeast, with a mean wind speed of 10.6 miles per hour. The trade winds persist approximately nine months out of the year. Trade winds blow vog from Hawai‘i Island’s volcanoes (e.g., Kilauea volcano), as well as other air contaminants, to the southwest. During the winter months, winds tend to be less predictable; there are longer periods of light and variable winds. Strong southerly, or “Kona”, winds occur and are associated with weather fronts and storms. When these conditions occur, much of the vog stays on the eastern side of the island, where it affects Hilo and the study area. In addition, when trade winds are absent for prolonged periods of time, vog travels up the island chain and can affect air health by increasing levels of SO₂ and PM_{2.5}. Although both of these pollutants are regulated by the EPA, Hawai‘i’s advisories for volcanic SO₂ and PM_{2.5} have been customized for local conditions. Air monitoring stations in communities near the volcano record regular exceedances of the NAAQS for SO₂ and occasional exceedances of the NAQQS for PM_{2.5}. The EPA considers the volcano a natural, uncontrollable event, and therefore the state requests exclusion from these NAAQS exceedances for attainment/non-attainment determination (DOH, 2015). Shorter exposure time intervals have also been adopted due to variable wind conditions, which can cause volcanic gas concentrations to change rapidly (USGS, 2017).

4.9 WATER QUALITY

Section 305(b) of the CWA requires states to assess the water quality of the waters of the state and prepare a comprehensive report documenting the water quality. The report is to be submitted to the EPA every two years. In addition, Section 303(d) of the CWA requires states to prepare a list of impaired waters on which total maximum daily loads (TMDLs) where corrective actions must be implemented. The EPA has delegated the Hawai‘i State Department of Health (HSDOH), Clean Water Branch as the agency in Hawai‘i responsible for enforcing the water quality standards and preparing the comprehensive report for submittal to the EPA.

Surface water quality in the study area is influenced by agricultural practices and residential, commercial, and industrial areas associated with urban development. Palai Stream is not include the 2018 Section 303(d) list of impaired waters (HSDOH, 2018). Therefore, the water quality of the stream has not been assessed. Waiakea Stream (Water Body ID 8-2-61) has been classified as an impaired waterbody due to elevated Total Nitrogen (TN), nitrite (NO₂) and nitrate (NO₃), and total phosphorous (TP). The HSDOH categorizes the priority for establishing TMDLs for streams as high, medium, or low. Waiakea Stream has been assigned as a medium TMDL priority category.

The specific water quality impairments of Waiakea Stream are typical of streams that bisect agricultural areas as TN, nitrate, nitrite, and TP are common constituents of fertilizers used in cultivation. The agricultural areas within the study area are located in the upstream portions of the watershed; therefore, these pollutants are carried downstream into the urban areas and ultimately into Hilo Bay.

4.10 GEOLOGIC RESOURCES

Geologic resources are defined as the topography, geology, soils, and mining of a given area. The existing physiography, soils, and geomorphology of the study area is a result of complex interactions of geological, hydrological, and meteorological processes that occurred during the Holocene epoch of the Quaternary period. The primary driver behind these processes are eruptions of the island's five coalesced shield volcanos: Kahala, Mauna Kea, Hualalai, Mauna Loa, and Kilauea. Mauna Loa is an active volcano which last erupted in 1984. USGS has mapped potential lava flow inundation zones which include most of the southern half of the Hilo watershed and most of the City of Hilo. The study area is located in a lava flow hazard zone 3, which is defined as an area where one to five percent of the area has been covered with lava since 1800 and 15 to 75 percent of the area has been covered within the last 750 years (Wright et al., 1992).

The underlying geology of the study area resulted from the lava flows of the Mauna Loa Volcano. The lava flow consists of Kau Basalt that was laid down approximately 5,000 to 10,000 years ago. Younger Kau Basalt lava flows border the northern (deposited 200 to 750 years ago) and southern (deposited 750 to 1,500 years ago) of the study area. These features are associated with the Mauna Loa southwest rift zone transitional unit.

The geology of the study area includes lava flows from Mauna Loa with volcanic rock close to the surface creating a hard surface layer that limits infiltration in some locations. Existing lava tubes in the area may route water underground where it reappears elsewhere as springs or seeps.

Earthquakes are often associated with volcanic activity and occur thousands of times annually; most of which are at a very small magnitude. Hilo, and the study area, is located in areas designated as an area designated seismic design code Dclassified as occurring in seismD1 and D2. These zones have a two percent chance for peak ground acceleration to exceed 67-percent and 83-percent gravity, respectively, over a 50 year exposure time (USGS, 2019).

A tsunami is a series of great waves, typically the result of a violent displacement of the seafloor. Tsunamis are characterized by high speeds (up to 560 miles per hour), long wave lengths (up to 120 miles), and long periods between successive wave crests (up to several hours). Tsunamis have the potential to inundate the coastline, causing severe property damage and/or loss of life. Located in the middle of the Pacific Ocean, Hawaii is susceptible to tsunamis from earthquakes and tsunamis generated by the Pacific Rim. The downstream portion of Waiakea Stream is within the tsunami evacuation zones (Hawaii County Civil Defense, 2019).

4.11 SOILS

The soils found in the study area is consistent with the Akaka-Honokaa-Kaiwiki soil association. Soils within this association are deep, gently sloping to steep, and moderately well drained. The soils are moderately fine textured soils formed from volcanic ash, are high in organic material, are very porous, and are continuously wet (USDA, 1973). **Table 1** lists the soil types and their extent within the study area.

Table 1: Extent of Soil Types within the Study Area

Soil Map Unit	Soil Name	Acres in Study Area	Percent of Soil in Study Area	Prime Farmland Soil	Hydric Soils
614	Waiakea hydrous loam, 2-20% slopes	515	2.0%	No	Yes
624	Kopua-Ihope complex, 3-10% slopes	1,124	4.4%	No	Yes
628	Papai extremely cobbly highly decomposed plant material, 2-10% slopes	4,117	16.2%	No	No
629	Panaewa very cobbly hydrous loam, 2-10% slopes	3,158	12.5%	No	Yes
637	Papai-Urban land complex, 2-10% slopes	1,940	7.7%	No	No
638	Panaewa-Urban land complex, 2-10% slopes	3,182	12.6%	No	No
639	Keaukaha-Urban land complex, 2-10% slopes	866	3.4%	No	Yes
640	Opihikao-Urban land complex, 2-20% slopes	1,438	5.7%	No	No
653	Keaukaha highly decomposed plant material, 2-10% slopes	2,344	9.3%	No	Yes
660	Olaa cobbly hydrous loam, 2-10% slopes	588	2.3%	No	No
662	Hakuma highly organic hydrous loam, 2-10% slopes	2,116	8.4%	No	Yes
664	Opihikao highly decomposed plant material, 2-20% slopes	34	0.1%	No	No
900	Kaiwiki hydrous silty clay loam, 0-10 % slopes	190	0.7%	Yes	Yes
901	Hilo ¹ hydrous silty clay loam, 0-10%	2,069	8.2%	Yes	No
902	Hilo ¹ hydrous silty clay loam, 20-35% slopes	67	0.3%	No	No

903	Hilo ¹ hydrous silty clay loam, 10-20% slopes	1122	4.4%	No	No
906	Kaiwiki hydrous silty clay loam, 10-20% slopes	116	0.5%	No	Yes
909	Hilo-Rock outcrop complex, 35-100%	350	1.4%	No	No
	Total	25,336	100%	-	

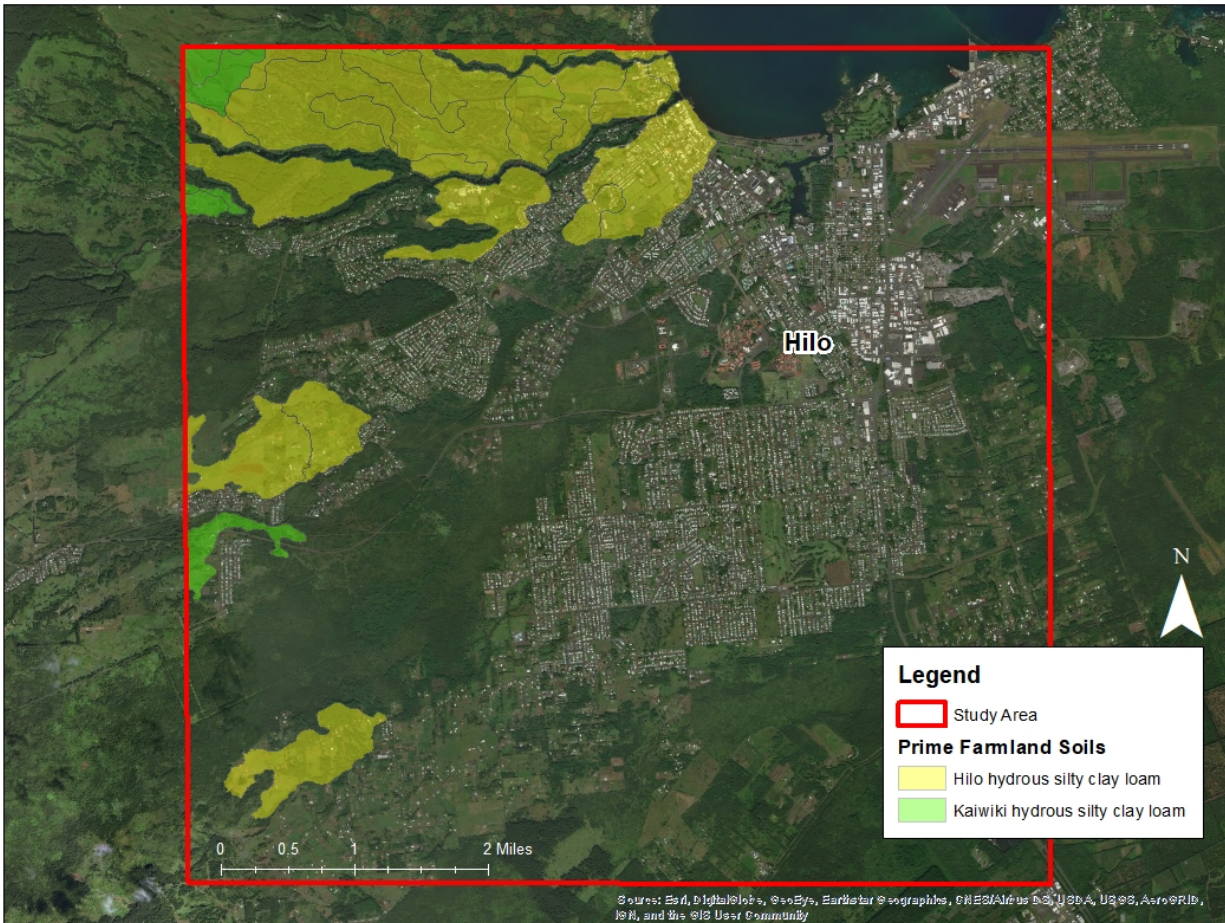
Source: NRCS Soil Data Mart (2019)

The Farmland Protection Policy Act of 1981 (FPPA)(P.L. 97-98) is intended to minimize the impact of Federal actions on the conversion of prime farmland, unique farmland, or land of statewide or local importance to non-agricultural uses. Farmland consists of cropland, forest land, rangeland, and pastures. Urban lands containing prime farmland soils are not covered under the FPPA.

Prime farmland is land that has the best combination of physical and chemical properties for producing food, feed, forage, fiber, and oilseed crops. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. Nearness to markets is also a consideration. Unique farmland is not based on national criteria. Farmland of statewide importance do not meet the qualifications of prime or unique farmland.

The study area includes two prime farmland soil types: Kaiwiki hydrous silty clay loam with 0- to 10-percent slopes and Hilo hydrous silty clay loam with 0- to 10-percent slopes. In addition, the Hilo soils have been designated as the State soil of Hawai'i due to its value for the production of sugarcane, ginger, taro, orchard crops, and forestry. The two prime farmland soils, concentrated in the northwestern quadrant of the study area, comprise 2,259 acres or 8.9-percent of land within the study area (**Figure 4**).

Figure 4: Prime Farmland Soils within the Waiakea-Palai Stream Study Area



4.12 BIOLOGICAL COMMUNITIES

Biological communities include plants and animals and the habitats in which they occur. They are important because they influence ecosystem functions and values, have intrinsic value, contribute to the human environment, and are the subject of a variety of statutory and regulatory requirements.

The study area is located in the Lowland Wet ecological system of the Tropical Moist Forest ecoregion. The Lowland Wet ecological system consists of natural communities below 3,000 feet in elevation and receiving greater than 75 inches of annual precipitation. Vegetative communities associated with this system include wet grasslands, shrublands, and forests. Biodiversity in the Lowland Wet system is high and supports specialized plants and animals.

Three separate biological surveys were conducted to assess the existing conditions within the project area, as well as the projected impacts on biological resources from the Proposed Action (USACE, 2005; USACE, 2010a; and USACE, 2010b). The results of these surveys, and information from additional research were used to characterize and assess the biological resources within the project area.

4.12.1 VEGETATION

The vegetative community within the study area has been altered as native habitats have been converted to agriculture and urbanization has introduced ornamental plant species. In addition, non-native invasive species have become established throughout much of the study area. Non-native species within the study area include strawberry guava (*Psidium cattleianum*), gunpowder (*Trema orientalis*), African tulip (*Spathodea campanulata*), common guava (*Psidium guajava*), albizia (*Falcataria moluccana*), melochia (*Melochia umbellata*), and kukui (*Aleurites moluccana*). Native vegetation extends upslope of the study area and is dominated by 'ōhi'a (*Metrosideros polymorpha*) trees and dense patches of 'uluhe (*Metrosidero polymorpha*). A full list of plant species observed in the study area is described in USACE (2005, 2010a, 2010b).

4.12.2 AQUATIC WILDLIFE

Biota occurring in the isolated pools associated with the streams in the study area include swordtails (*Xiphophorus helleri*) and marine toad tadpoles (*Bufo marianus*), which are abundant throughout the study area. Dragonfly and damselfly naiads (Odonata) and red swamp crayfish (*Procambarus clarkii*) are common. Guppies (*Poecilia reticulata*) are occasionally encountered schooling with swordtails. Mosquitofish (*Gambusia affinis*), bullfrogs (*Rana catesbeiana*), and adult marine toads are uncommon. A full list of aquatic fauna observed in the study area is described in USACE (2005, 2010a, 2010b).

4.12.3 TERRESTRIAL SPECIES

Avian species identified within the project area were dominated by non-native species. The only native species identified was the Pacific-golden Plover (*Pluvialis fulva*). Similarly, no native mammals were identified within the study area; non-native species included the Indian mongoose (*Herpestes auro punctatus*), dogs (*Canis familiaris*), and pigs (*Sus scrofa*). A full list of terrestrial wildlife species observed in the study area is described in USACE (2005, 2010a, 2010b).

4.13 BIOLOGICAL COMMUNITIES

Three separate biological surveys were conducted to assess the existing conditions within the project area, as well as the projected impacts on biological resources from the Proposed Action (USACE, 2005; USACE, 2010a; and USACE, 2010b). The results of these surveys, and information from additional research were used to characterize and assess the biological resources within the project area, as well as any anticipated effects on biological resources within the project area from the Proposed Action.

4.13.1 THREATENED AND ENDANGERED SPECIES

Wildlife and plant species may be classified as threatened or endangered under the Endangered Species Act (ESA) of 1973. Protection of non-marine protected species is overseen by the USFWS and NMFS is responsible for protected marine species. The purpose of the ESA is to establish and maintain a list of threatened and endangered species and establish protections for their continued survival. Section 7 of the ESA requires federal agencies to coordinate with USFWS and NMFS to ensure that any federal action is compliant with the ESA and that the action will not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification to their critical habitat. The State of Hawai'i has also developed a State list of threatened and endangered species and incorporated it in the Hawai'i Comprehensive Conservation Strategy (HCCS)(Mitchell et al., 2005).

Three ESA-listed species were identified in an 8 June 2018 informal consultation letter from the USFWS (**Attachment 1**). Habitat and life requisites for these species are provided below. No critical habitat for any listed species is designated within the study area. Habitat suitable for the Hawaiian coot and Hawaiian hawk are also absent within the study area. During field investigations, no threatened or endangered species were observed within the study area (USACE 2005, 2010a, 2010b).

4.13.1.1 HAWAIIAN HOARY BAT

The 'Ōe'ape'a or Hawaiian hoary bat (*Lasiurus cinereus semotus*) is Hawai'i's only native terrestrial mammal (Mitchell et al., 2005). The bats roost in 3- to 29-foot tall native and non-native vegetation. Key plant species used for roosting include 'ōhi'a, pu hala (*Pandanus tectorius*), coconut palms (*Cocos nucifera*), kukui (*Aleurites moluccana*), kiawe (*Proscopis pallida*), avocado (*Persea americana*), shower trees (*Cassia javanica*), pūkiawe (*Styphelia tameiameia*), and fern clump. They may also roost in stands of eucalyptus (*Eucalyptus* spp.) and Sugi pine (*Cyrtomeria japonica*). The bats feed on a variety of native and non-native night-flying insects, including moths, beetles, crickets, mosquitoes, and termites. The hoary bat mates between September and December and gives birth in May and June. Because bat reproductive success is highly correlated to warm temperatures, it is likely that key breeding habitat for bats on the island of Hawai'i would occur below 4,200 feet elevations.

4.13.1.2 HAWAIIAN HAWK

The 'io, or Hawaiian Hawk, is the only broad-winged hawk known to have colonized Hawai'i (Mitchell et al., 2005). The hawks feed on insects, birds, and rodents. The hawks inhabit lowland non-native forests, urban areas, agricultural lands, pasturelands, and high elevation native forests from sea level to elevations of 5,600 feet. Although hawk nests have been found in non-native trees, most nests are constructed in 'ōhi'a trees. The hawks may seasonally occupy different habitats as they have been found to winter in subalpine māmane /naio forests.

4.13.2 HAWAIIAN COOT

The 'Alae ke'oke'o, or Hawaiian Coot is an endemic waterbird in Hawai'i (Mitchell et al., 2005). The Hawaiian Coot is a generalist with a diet ranging from seeds and leaves, snails, crustaceans, insects, tadpoles, and small fish. The coots typically forage in water less than 12-inches deep. The coots create floating nests in open water, constructed of aquatic vegetation, and anchored to emergent vegetation. Open water nests are typically composed of water hyssop (*Bacopa monnier*) and Hilo grass (*Paspalum conjugatum*) while platform nests in emergent vegetation are comprised from buoyant stems of bulrushes (*Scirpus* spp.). The coot inhabits lowland wetland habitats with suitable emergent plant growth interspersed with open water. These habitats include freshwater wetlands, taro fields, freshwater reservoirs, canefield reservoirs, sewage treatment ponds, brackish wetlands, and rarely saltwater habitats. Hawaiian coots inhabit Waiākea and Loko ponds on the island of Hawai'i.

4.14 SPECIAL STATUS SPECIES AND PROTECTED HABITAT

4.14.1 MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703-712) prohibits the take of migratory birds resulting from activities unless authorized by the USFWS. Take includes pursuing, hunting, capturing, and killing of migratory birds or any part of their nests or eggs. The Act also prohibits the sale, purchase, or shipment of migratory birds, nests, or eggs. The MBTA is an international treaty with the U.S., Canada, Mexico, Japan and Russia. Non-native bird species are not protected under the MBTA.

4.14.2 MARINE MAMMALS

The Marine Mammal Protection Act of 1972 (MMPA)(16 U.S.C. 1361-1407) prohibits the take of marine mammals in U.S. waters and the importation of marine mammals and marine mammal products into the U.S. Take includes the harassment, feeding, hunting, capture, collection, or killing of any marine mammal or part of a marine mammal. All cetaceans, (whales, dolphins, porpoises), sirenians (manatees and dugongs) and several marine carnivores (seals, sea lions, otters, walrus, and polar bears) are protected under the MMPA. The Act also established the Marine Mammal Commission, the International Dolphin Conservation Program, and the Marine Mammal Health and Stranding Response Program.

There are a total of 26 marine mammals documented in the Hawaiian Islands:

- Bottlenose dolphin (*Tursiops truncatus*)
- Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)
- Pan-tropical spotted dolphin (*Stenella attenuata*)
- Risso's dolphin (*Grampus griseus*)
- Rough toothed Dolphin (*Steno bredanensis*)
- Spinner Dolphin (*Stenella longirostris*)
- Striped Dolphin (*Stenella coeruleoalba*)
- Hawaiian monk seal (*Monachus schauinslandi*)
- Northern fur seal (*Callorhinus ursinus*)
- Northern elephant seal (*Mirounga angustirostris*)
- Blainsville's beaked whale (*Mesoplodon densirostris*)
- Blue whale (*Balaenoptera musculus*)
- Bryde's whale (*Balaenoptera edeni*)
- Cuvier's beaked whale (*Ziphius cavirostris*)
- Dwarf sperm whale (*Kogia simus*)
- False killer whale (*Pseudorca crassidens*)
- Fin whale (*Balaenoptera physalus*)
- Humpback whale (*Megaptera novaeangliae*)
- Killer whale (*Orcinus orca*)
- Melon-headed whale (*Peponcephala electra*)
- North Pacific right whale (*Eubalaena japonica*)
- Pygmy killer whale (*Feresa attenuata*)
- Pygmy sperm whale (*Kogia breviceps*)
- Sei whale (*Balaenoptera borealis*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)
- Sperm whale (*Physeter macrocephalus*)

4.14.3 ESSENTIAL FISH HABITAT

Congress enacted amendments to the Magnuson-Stevens Fishery and Conservation and Management Act (MSFCMA)(Public Law 94-265) in 1996 that established procedures for identifying Essential Fish Habitat (EFH) and required interagency coordination to further the conservation of federally managed

fisheries. Rules published by NMFS (50 CFR Sections 600.805 – 600.930) specify that any federal agency that authorizes, funds or undertakes, or proposes to authorize, fund or undertake an activity which could adversely affect EFH is subject to consultation provisions of the MSFCMA and identifies consultation requirements.

EFH consists of those habitats necessary for spawning, breeding, feeding, or growth to maturity of species managed by the Regional Fishery Management Councils, as described in a series of Fishery Management Plans, pursuant to the Act. EFH is designated in the Hawaii Archipelago of the Western Pacific Region in marine waters from the shoreline out to the Economic Exclusion Zone. There is no EFH designated in inland waters in the Hawaii Archipelago. While the study area involves only inland waters, the Corps considered potential impact to downstream EFH beginning at the shoreline transition from Waiakea Pond to Hilo Bay. EFH is designated downstream of the study area for the following federally managed fisheries:

- Bottomfish Fishery
- Pelagic Fishery
- Crustacean Fishery

4.14.4 CORAL REEFS

Executive Order (EO) 13089, Coral Reef Protection, was enacted to preserve and protect the biodiversity, health, heritage, and ecological, social, and economic values of U.S. coral reef ecosystems and the marine environment. An interagency task force, the U.S. Coral Reef Task Force, was created in order to fulfill the EO's protection efforts. The task force works with State, territorial, commonwealth, and local government agencies, nongovernmental organizations, the scientific community, and commercial interests to develop and implement measures to restore damaged coral reefs and to mitigate further coral reef degradation (EPA, 2019b).

The corals in Hilo Bay are limited in number and extent and consist of relatively small “recruit” colonies of coral, with no established coral reefs. The coral species in the Bay are comprised primarily of brown and blue *Montipora* sp. and some *Porites* sp (Gulko, 1998). The Hilo Bay breakwall, which was constructed on Blonde Reef, limits the growth of the coral population within Hilo Bay as the breakwall limits circulation of salt water entering the bay. The breakwater also concentrates freshwater entering the Bay from ground water and streams including Waiakea and Palai Streams. The freshwater inflows result in salinities that are below the threshold for most coral species.

4.15 SOCIOECONOMICS

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population, demographics, and economic development. Demographics entail population characteristics and include data pertaining to race, gender, income, housing, poverty status, and educational attainment. Economic development or activity typically includes employment, wages, business patterns, and area's industrial base, and its economic growth.

Hilo is the fifth largest city in the State of Hawai'i with a population of 43,263 based on the 2018 U.S. census estimate data (U.S. Census Bureau, 2018). Hilo is the County seat and the only metropolitan area of Hawai'i County. Hilo functions as the industrial, commercial, distribution, and population core of the island.

According to the 2010 census, the population of Hawaii County includes approximately 185,079 residents, which is an approximately 19.7 percent increase from the 2000 census (U.S. Census Bureau, 2018). The project area is located within census tract number 207.02. Census tract 207.02 had a population of 4,861 in the 2010 census, which is approximately 2.6 percent of the total population of Hawaii County. Persons aged 18 years and over account for 143,992 of the population of Hawaii County, or 77.8 percent, while this age group makes up about 83.5 percent of the census tract population. Hawaii County’s 65 years and older population is approximately 29,427, or 15.9 percent of the County population, while this age group consists of 859 or 17.7 percent of the census tract population.

Population growth for Hawai‘i County is estimated to increase over the next 50 year. Future population estimates for the County are provided in **Table 2**. It is expected that the current demographics of the area (e.g. race, age) proportions would be similar to the existing condition.

Table 2: Future population estimates and growth to 2045 for the State and County of Hawai‘i

Year	State of Hawai‘i		County of Hawai‘i	
	Average growth rate (%)	Population Estimate	Average growth rate (%)	Population Estimate
2010	-	1,363,621	-	185,406
2018	-	1,420,191	-	-
2025	0.7	1,514,700	1.3	222,400
2035	0.5	1,592,700	1.1	248,500
2045	0.3	1,648,600	1.0	273,200

US Census Bureau, 2019

Hawaii Island is divided into nine districts and the study area is within the South Hilo District. According to the County of Hawaii General Plan (County of Hawaii, 2014), desirable economic actions for the South Hilo District are to encourage development of the university and airport facilities; implement programs to revitalize downtown Hilo; encourage manufacturing operations utilizing local raw materials; assist the local fishing industry; improve the skill level of the local work force; expand the existing athletic-exhibition-conference facilities; and support aquaculture and terrestrial agricultural investments.

The median household income estimates are provided in **Table 3**.

Table 3: Mean Income of the Study Area

Geographic Unit	Mean Income
Hawai‘i	\$95,569

Hawai'i County	\$73,391
Hilo	\$69,843
Census Tract 207.02	\$76,699

U.S. Census Bureau, 2018

The income of approximately 19-percent of Hilo residents are considered as persons of poverty, compared to 15-percent for the County and 9.5-percent for the State. Racial distribution for Hilo, Hawai'i County, and the State are provide in **Table 4**.

Table 4: Racial Distribution for the City of Hilo and the State of Hawai'i

Race	% Census Tract 207.02	% of Hilo	% of Hawai'i County	% of State of Hawai'i
White	34.2	18.5	34.0	25.7
African American	0.8	0.9	0.8	2.2
American Indian/Alaska Native	0.6	0.2	0.6	0.4
Asian	22.5	32.6	21.4	37.8
Native Hawaiian/Pacific Islander	12.5	9.5	13.1	10.2
Two or more races	29.5	37.7	30.1	23.8
Hispanic or Latino	-	11.2	12.7	10.5
White/Not Hispanic or Latino	-	15.7	30.3	21.9

Source: U.S. Census Bureau Quick Facts (U.S. Census Bureau, 2018)

4.15.1 ENVIRONMENTAL JUSTICE

In order to comply with EO 1289, ethnicity and poverty status in the study area were examined and compared to regional, state, and national data to determine if any minority or low-income communities could potentially be disproportionately affected by the implementation of the proposed action. No indication of disproportionately low income or minority specific populations were identified during site surveys of the study area. The data provided in **Table 3** and **Table 4** above also supports the field investigation.

4.15.2 PROTECTION OF CHILDREN

EO 13045 requires that federal actions consider potentially health and safety risks to children resulting from that action. The locations of areas where children may congregate (e.g., child care centers, schools, parks, etc.) were identified within the study area. Due to the extent of the study area, these areas, and the impacts resulting from the proposed action, are identified in the Consequences Chapter (**Chapter 4**).

4.16 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

To complete the Phase I Hazardous, Toxic, and Radioactive Waste (HTRW) survey, USACE reviewed existing environmental documentation and environmental regulatory databases. USACE contacted the Hawai'i State Departments of Health (DOH), Land and Natural Resource (DLNR), OEQC, and the Hawai'i County Planning Department to obtain information about property history, environmental conditions, and any HTRW incidents, violations, or permit actions which may have occurred within the areas encompassing the final array of alternatives.

Federal, state, and local agency environmental records and regulatory databases were searched to determine the existence of any license or permit actions, violations, enforcements, and/or litigation against property owners, and to obtain general information about potential past incidents of HTRW releases. Results of the database searches include:

- No U.S. EPA National Priority List (NPL) or Superfund sites are within a one mile radius of the project alternative areas
- No Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site is located within a 0.5-mile radius of the project alternative areas
- No Resource Conservation and Recovery Information System (RCRIS) treatment, storage, or disposal (TSD) facility is located with a 0.5-mile radius from the project alternative areas
- No Resource Conservation and Recovery Act (RCRA) Corrective Action Reports (CORRACTS) were identified within a one mile radius of the project alternative areas
- No RCRA generators are located within the project alternative areas or adjacent properties
- No underground storage tanks (USTs) are located within a 0.25-mile radius of the project alternative areas
- One leaking underground storage tank (LUST) was located within a one mile radius of the project alternative areas
- No active landfills are located within a 0.5-mile radius of the project alternative areas
- No spills or incidents connected with the properties of the project alternative areas are entered in the Emergency Response Notification System (ERNS) database.

The records search of the DOH Solid and Hazardous Waste Branch, USTs Section was conducted for information on the LUSTs within, and in the vicinity of the project alternative areas. As stated in the synopsis above, the LUST database revealed one UST (Kawailani Laundromat, 511 West Kawailani Sreet) with a confirmed release of diesel fuel on 13 November 1997. The release was less than 25 gallons and resulted in appropriate remedial action including removal of the LUST. This site is located approximately one mile northwest of the project alternative areas.

A visual survey was conducted for areas included in the final array of alternatives on 12 January 2005 to look for evidence of potential HTRW or impacts therefrom. Follow-up HTRW surveys were performed

on 5 February and 7 May 2019. Project alternative sites were reconnoitered for evidence of possible HTRW contamination including partially buried containers, discolored soil, seeping liquids, film or sheen on water surfaces, abnormal or dead vegetation or animals, malodors, dead-end pipes, anomalous grading, fills, depressions, or other evidence of possible environmental contamination. Based on the visual survey of the area, no apparent signs of HTRW contamination exists within the proposed alternative project areas.

4.17 CULTURAL RESOURCES

Archaeology

Several archaeological surveys have been conducted as part of various development projects in the vicinity of the study area, and were reviewed to characterize potential archaeological resources within the study area. The majority of the study area has been developed with residential and community land uses (e.g., parks, community centers, churches) and a few small-scale commercial uses. Due to the land use history of intensive agricultural cultivation and residential development, most archaeological, historic or cultural features that remain are likely to be associated with the sugar plantation or other historic uses of the area. Any pre-contact resources likely would have been destroyed by the agricultural operations or during subsequent suburban development of the area. (Escott, 2004, Geometrician Associates, 2006, Pacific Legacy, 2005).

Historic Resources

A total of 331 properties and historic districts are listed on the National Register of Historic Places (NRHP) for the State of Hawaii; of these, 73 are located on Hawaii Island. The listed historic property closest to the study area is the Waiakea Mission Station – Hilo Station (NPS, 2014). The Waiakea Mission Station – Hilo Station is located on Haili Street, approximately 4.8 miles from the study area.

The Hawaii Register of Historic Places formally recognizes districts, sites, structures, buildings and objects and their significance in Hawaii's history, architecture, archaeology, engineering and culture. No structures within the vicinity of study area are listed on the Hawaii Register of Historic Places for the Island of Hawaii (SHPD, 2014). The historic property closest to the study area is the S. Hata Building, approximately 5.0 miles from the study area.

Traditional or Cultural Practices

Hawaii Revised Statutes Section 7-1 has codified some recognized traditional and cultural practices. These traditional and cultural practices include the right to gather firewood, house-timber, aho cord, thatch, or ki leaf, for private use. Other traditional or cultural practices not specifically enumerated in the Constitution of the State of Hawaii or its statutes have also been recognized. These practices may include the stewardship and healing/restoration of lands established by actual practice. A Cultural Impact Study (CIS) was conducted for the study area in 2005. The CIS concluded that, based on the results and findings from interviews and archival research there are no known culturally significant traditional properties and resources in the study area; and the study area does not appear to support any traditional cultural practices. Archival research indicated a rich past of Hawaiian settlements, agriculture, and temples; however, little evidence remains due to the extensive and intensive cultivation of sugar cane in the late 19th and early 20th centuries (Pacific Legacy, 2005).

4.18 NOISE

Noise is generally defined as unwanted sound. Noise can be any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human responses to noise vary depending on the type and characteristics of the noise, distance between the noise source and receptor, receptor sensitivity, and time of day.

Determination of noise levels are based on 1) sound pressure level generated (decibels [dB] scale); 2) distance of listener from source of noise; 3) attenuating and propagating effects of the medium between the source and the listener; and 4) period of exposure.

An A-weighted sound level, measured in dBA, is one measurement of noise. The human ear can perceive sound over a range of frequencies, which varies for individuals. In using the A-weighted scale for measurement, only the frequencies heard by most listeners are considered. This gives a more accurate representation of the perception of noise. The noise measure in a residential area, similar to conditions within the study area, is estimated at approximately 70 dBA. Normal conversational speech at a distance of five to ten feet is approximately 70 dBA. The decibel scale is logarithmic, so, for example, sound at 90 dBA would be perceived to be twice as loud as sound at 80 dBA. Passenger vehicles, motorcycles, and trucks use the roads in the vicinity of the project area. Noise levels generated by vehicles vary based on a number of factors including vehicle type, speed, and level of maintenance. Intensity of noise is attenuated with distance. Some estimates of noise levels from vehicles are listed in **Table 5** (Cavanaugh and Tocci, 1998).

Table 5: Typical Noise Sources

Source	Distance (ft)	Noise Level (dba)
Automobile, 40 mph	50	72
Automobile Horn	10	95
Light Automobile Traffic	100	50
Truck, 40 mph	50	84
Heavy Truck or Motorcycle	25	90

Source: Cavanaugh and Tocci, 1998

State of Hawaii HAR Title 11, Chapter 46 Community Noise Control, sets permissible noise levels in order to provide for the prevention, control, and abatement of noise pollution in the State. The regulation creates noise districts based on land use that dictate acceptable noise levels. The study area is located in a conservation/open space within the vicinity of residential use. Therefore, the study area is in a Class A zoning district, as defined by HAR 11-46. The maximum permissible sound level in a Class A district is 55 dBA from 7:00am-10:00pm and 45 dBA from 10:00pm-7:00am.

The EPA has identified a range of yearly day-night sound level (DNL) standards that are sufficient to protect public health and welfare from the effects of environmental noise (EPA, 1977). The EPA has established a goal to reduce exterior environmental noise to a DNL not exceeding 65 dBA and a future

goal to further reduce exterior environmental noise to a DNL not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather they are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

The U.S. Occupational Safety and Health Administration (OSHA) has established acceptable noise levels for workers. **Table 6** shows permissible noise levels for varying exposure times.

Table 6: OSHA Permissible Noise Exposures

Duration per day-hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: OSHA, 2012

The Noise Control Act of 1972 (42 United States Code [U.S.C.] 4901 to 4918) established a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of Federal research and activities in noise control, authorizes the establishment of Federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products (42 U.S.C. 4901). The Act authorizes and directs that Federal agencies, to the fullest extent consistent with their authority under Federal laws administered by them, carry out the programs within their control in such a manner as to further the policy declared in 42 U.S.C. 4901.

Federal workplace standards for protection from hearing loss allow a time-weighted average level of 90 dBA over an 8-hour period, or 85 dBA averaged over a 16-hour period. Noise annoyance is defined by the EPA as any negative subjective reaction on the part of an individual or group (EPA, 1977). For community noise annoyance thresholds, a day-night average of 65 dBA has been established by the United States Department of Housing and Urban Development (HUD) as eligibility for Federally guaranteed home loans. (Federal Interagency Committee on Noise, 1992).

Noise impact analyses often identify facilities such as hospitals, churches, schools, and day care centers specifically as these facilities are relatively more sensitive to increased noise levels. These facilities are designated as sensitive receptors and are specifically used in noise impacts.

The study area is located in residential and open conservation land in the suburban town of Hilo on the Island of Hawaii. The noise environment in Hilo is characteristic of a suburban environment; the setting is dominated by vehicular and residential noise. The proposed project area is not significantly affected

by airfield noise. The closest airfield to the proposed project area is Hilo International Airport, which is approximately seven miles northeast of the proposed project area.

4.19 VISUAL AESTHETICS

Visual resources are defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and manufactured features are considered characteristic of an area if they are inherent to the structure and function of a landscape.

The County of Hawai'i General Plan includes the goal to "protect scenic vistas and view planes from becoming obstructed" (County of Hawai'i, 2014). The plan states that important views within the South Hilo District include views of Mauna Koa, Mauna Loa, Hilo Bay, coastal areas, and waterfalls.

The study area is moderately urbanized, including residential and public lands. Relatively undeveloped and agricultural lands are found in the upper elevations of the study area with increasing development towards Hilo Bay. The visual aesthetics of these areas is typical of suburban and pastoral environments.

4.20 RECREATION

Recreation is comprised of terrestrial- and water-based activities associated with the local population or visitors to the island. Recreation may consist of aquatic activities such as swimming, windsurfing, surfing, fishing, jet skiing, kayaking, snorkeling, scuba diving, and water skiing. Terrestrial recreational activities may consist of hiking trails, biking trails, parks, golf courses, and ball fields.

There are eight neighborhood parks located within the study area, as well as 17 gymnasiums. The Ho'olulu Complex is the major regional recreational center and consists of 56 acres. There is an auditorium with a seating capacity of 2,800 that is used for pageants, private fundraising, musical entertainment, and sports events. The Panaewa Recreation Complex is located on a 173-acre parcel in South Hilo. The complex includes the Rainforest Zoo and the Equestrian Center, consisting of a race track, rodeo arena, and other equestrian facilities.

There are eight developed beaches in Hilo. These beaches include the Hilo Bayfront Beach, Mokuola (Coconut Island), Reed's Bay, Onekahakaha Beach Park, Leleiwi Beach Park, James Kealoha Beach Park, Carlsmith, and Richardson Ocean Park Beaches. In addition, Lihikai (Onekahakaha) has a small sand beach with shallow water and is especially good for children.

Hilo has two general use oceanfront parks: Liliuokalani and Bayfront-Mooheau Park. In addition, Honolii Beach Park (used primarily by surfers) and Kolekole Gulch Park at Wailea (used mainly for picnicking and camping with limited swimming in the stream) are also located in the South Hilo District.

Near the mouth of the Wailoa River is the State's Wailoa River State Recreation Area. The recreation area includes a pond maintained as a public fishing area. In addition, the park provides areas for picnicking, walking, and quiet relaxation. Further, the large pavilions at Wailoa River State Recreation Area are frequently used for community meetings and banquets. An 18-hole municipal golf course is located in the Waiakea Homesteads area. Other non-public recreational facilities occur in the study area such as baseball and softball fields.

5 FUTURE WITHOUT PROJECT CONDITION

The environmental consequences chapter describes the probable effects or impacts of implementing any of the action alternatives (the Future with Project condition or FWP). Effects can be either beneficial or adverse, and are considered over a 50-year period of analysis (2023-2073).

Environmental impacts will be assessed according to state environmental regulations (Hawaii Revised Statutes Chapter 343 – Environmental Impact Statements and Hawaii Administrative Rules 11-200 – Environmental Impact Statement Rules), as well as federal guidelines (NEPA). Descriptions of the assessment criteria under both state and federal guidelines are presented below.

5.1 STATE ENVIRONMENTAL GUIDELINES

A “significant effect” is defined by HRS Chapter 343 as “the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State’s environmental policies or long-term environmental goals as established by law, or adversely affect the economic welfare, social welfare, or cultural practices of the community and State.”

5.2 FEDERAL ENVIRONMENTAL GUIDELINES

The CEQ regulations (40 CFR 1508.7 and 1508.8) define the impacts that must be addressed and considered by Federal agencies in satisfying the requirements of the NEPA process, which includes direct, indirect and cumulative impacts.

Direct are caused by the action and occur at the same time and place. Indirect Impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water and other natural systems, including ecosystems.

Impacts include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (40 CFR 1508.8).

According to the CEQ regulations (40 CFR 1500-1508), the determination of a significant impact is a function of both context and intensity. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the Proposed Action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant impact may exist even if the Federal agency believes that on balance the effect will be beneficial.

2. The degree to which the Proposed Action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR 1508.27).

To determine significance, the severity of the impact must be examined in terms of the type, quality and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short or long-term) and other consideration of context. Significance of the impact will vary with the setting of the Proposed Action and the surrounding area (including residential, industrial, commercial, and natural sites).

The No Action Alternative and three action alternatives, as described in the Plan Formulation section of the study's IFR/EA were considered in analyzing impacts from the implementation of any FRM measures:

1. No Action Alternative
2. Kupulau Ditch/Floodwall with Detention (Kupulau)
3. Hilo Municipal Golf Course with Detention (Golf Course)
4. Combination of the Alternatives 2, and 3 (Combination)

The future without project condition (FWOP), also known as the "No Action Alternative", is the most likely condition expected to occur in the future in the absence of the proposed action or action alternatives. As with the Future with Project Conditions, the impacts to resources are projected over a 50-year window, or the designed life of the proposed project. Therefore, the FWOP conditions project changes that would occur until the year 2072. For the study area, the No Action Alternative means that

no FRM measures will be implemented in the future, and urbanization and development will continue at its present rate.

5.3 LAND USE

Under the FWOP conditions, land use is expected to continue to shift from pastoral land uses to urban development as the Hilo population continues to increase. The resulting expansion of residential, commercial, and industrial land uses will result in an increase of impervious cover, exasperating the intensity and frequency of flood events.

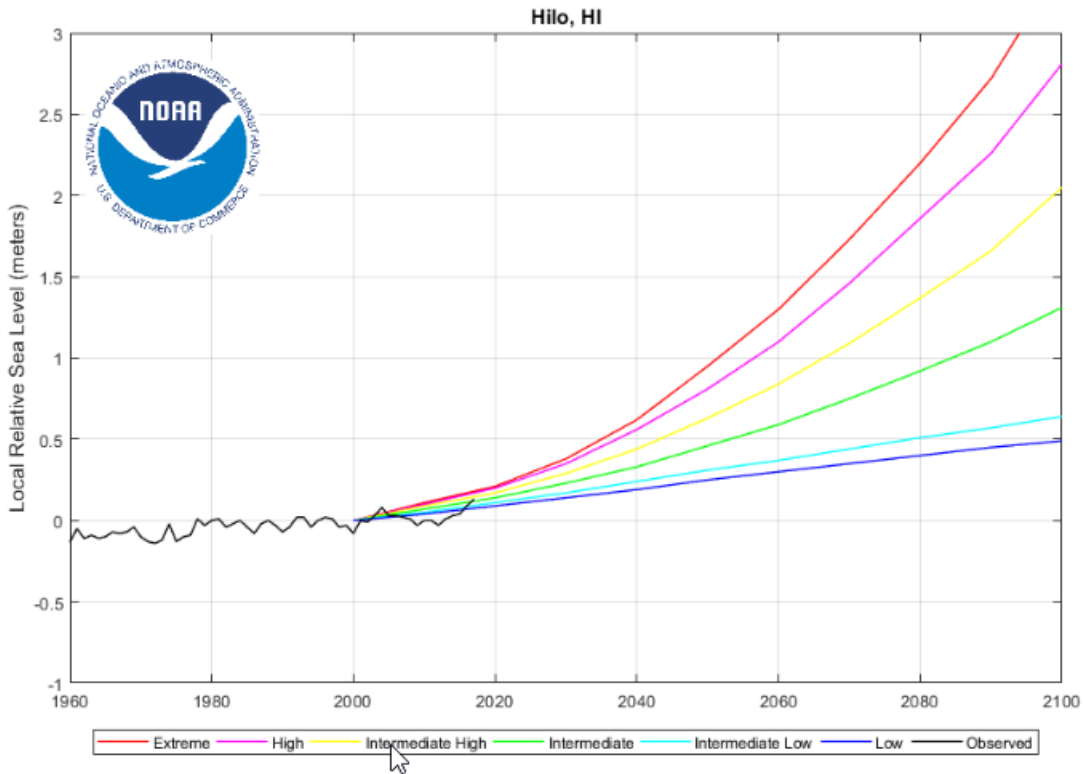
5.4 CLIMATE

Projected climate change caused by man-made increases in greenhouse gases will result in changes under the FWOP condition. Scientific research indicates that the Global Mean Sea Level has been increasing since the 1990s, which has seen a sea level rise (SLR) rate of approximately 0.14 inches per year or roughly twice the rate seen in the past 100 years. Rise in sea levels is linked to several climate-related factors, all induced by the ongoing global climate change including water thermal expansion, and melting of glaciers and ice sheets.

Relative sea level rise (RSLR) for Hilo were calculated using methods described by Sweet et al. (2017) and presented on the NOAA (National Oceanic and Atmospheric Administration) Sea Level Trend mapper (NOAAa, 2019). RSLR for Hilo is expected to increase 0.3 to 0.7 feet by 2030, 0.6 to 1.4 feet by 2050, and 1.6 to 4.6 feet in 2100 (Kopp et al., 2014; NOAAb, 2019)(**Figure 5**). Sea level rise not only results in the inundation of coastal areas and infrastructure, but can also exacerbate the encroachment of saline groundwater into freshwater aquifers. Climate change is predicted to influence weather patterns leading to an increase in periods of drought, higher temperatures and evaporation rates for soil and water bodies, and more intense storms and weather events. For the FWOP conditions, these factors will lead to an increased intensity of flood events within the study area.

Figure 5: Annual Mean Relative Sea Level Trends for Hilo, Hawaii

Station 1617760 (Source – NOAA, 2019)



5.5 WATER RESOURCES

Under the FWOP conditions, water resources would be predominantly affected by climate change as increased drought, evaporation, and intensity of storm events would alter streams, ponds, and coastal bays and estuaries.

5.5.1 HYDROLOGY AND HYDRAULICS

Because the streams in the study area are intermittent, the FWOP conditions will trend towards less frequent flows in the streams and a higher probability of the streams flooding due to the increase in extreme storm events. The flooding rates will be exacerbated due to a projected increase in impervious cover as the urban landscape shifts from pastoral to an increase in residential, commercial, and industrial development. This increase in impervious cover of the watershed will increase storm water runoff into the streams and magnify intensity of the flooding.

5.5.2 FLOODPLAINS

Similar to the FWOP conditions for the streams, climate change will affect the 0.1 ACE floodplain as the higher intensity storm events will flood a larger footprint. Although the floodplains associated with the streams are restricted to relatively narrow corridors along the water courses, the increased flooding intensity will expand these floodplains and increase the sheet flow flooding in adjacent areas.

5.5.3 WETLANDS

No wetlands associated with Waiakea Stream, Palai Stream, and Four Mile Creek were identified; therefore, the FWOP for wetlands within the study area would not differ from the existing conditions.

5.5.4 SURFACE WATERS

In absence of the proposed project, the surface waters within the study area would not be affected by detention or diversion of the stream courses. However, as addressed in **Section 4.5.1** (Hydrology and Hydraulics) above, climate change will affect surface waters as increased storm intensities and extended droughts will alter the duration and flows of the streams.

5.5.5 GROUNDWATER

The freshwater aquifers within the study area would be infiltrated by saline groundwater as RSLR increases in the FWOP condition. The infiltration would result in a shallower freshwater lens in which to draw irrigation and drinking water. Deeper wells may no longer be viable as the saline ground water rises.

5.6 COASTAL ZONE MANAGEMENT RESOURCES

Under the FWOP, the FRM project would not be constructed and impacts to coastal zone management resources would continue to be affected by ongoing urban development.

5.7 AIR QUALITY

The study area is located in an attainment area for all NAAQS (EPA, 2019a). As laws have been implemented restricting the emissions of criteria pollutants and there is an increase in clean power initiatives, future air quality in the FWOP scenario is projected to improve or remain unchanged under the FWOP.

5.8 WATER QUALITY

Water quality changes under the FWOP are difficult to predict. HSDOH has not established TMDLs for the Waiakea Stream; however, the agency is required to set the limits according to the CWA. The establishment of the TMDLs is the first step in addressing the water quality of the streams. The water quality impairments associated with Waiakea Stream are the result of agricultural practices within the watershed. As the urbanization of the watershed extends into neighboring agricultural lands converting the land to residential and other urban land uses, the contribution of the criteria pollutants identified for the stream should decrease. However, an increase in the application of lawn and garden fertilizers and an increase in runoff from residential areas could result in a conversion of non-point sources resulting in no change, or possibly a decrease, in water quality. If the City of Hilo initiates best management practices to address the future TMDLs, the water quality of Waiakea Stream could improve under the FWOP conditions.

5.9 GEOLOGIC RESOURCES

Volcanism is the primary driver of change in the geologic resources of the study area. Due to the unpredictability of volcanic eruptions, it is impossible to predict whether the study area would be impacted by volcanic activity in the next 50 years. The FWOP condition is projected to remain unchanged with a slight probability that a lava flow resulting from the eruption of Mauna Loa could reach the coastline as it did in 1859, 1868, 1887, 1919, 1926, and three times in 1950.

5.10 SOILS

As urban development continues in the watershed, prime farmland and hydric soils will be lost. The act of annexing adjacent farmland in and of itself is a loss of prime farmland, even if farming practices continue on the annexed land. The FWOP condition for the spatial extent of prime farmland soils is expected to decrease over the next 50 years.

5.11 FISH AND WILDLIFE

Under the FWOP, impacts to fish and wildlife resources would not occur without the proposed alternatives. Effects of climate change on ecosystems are difficult to predict, due to both uncertainty in climate change scenarios (direction and magnitude of temperature and precipitation) and uncertainty in understanding how species will respond to those changes. These changes may increase the likelihood of species warranting conservation and protection.

As land use changes in the future, it is reasonable to expect that shifts in the distribution of fish and wildlife communities may occur to seek habitat which meets their life requisites. However, such range shifts are only feasible with adequate habitat, an ability to disperse and colonize, availability of food resources, and absence of physical barrier which might preclude movement. Displaced species may be subject to increased predation, be susceptible to disease, or be maladapted to their new habitat.

5.12 SOCIOECONOMICS

Under the FWOP conditions, existing conditions would remain and there would be no changes to the health risks for children or changes in the minority/low income populations.

5.13 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

The HTRW conditions in the alternative study area will most likely stay the same in the FWOP condition. The alternative study area has been essentially built out and no new HTRW sources are expected to be introduced into the area.

5.14 NOISE

Under the FWOP conditions, existing conditions would remain and there would be no changes to the noise levels within the study area.

5.15 VISUAL AESTHETICS

Under the FWOP condition, no FRM features would be constructed; therefore no changes to the visual aesthetic would occur.

5.16 RECREATION

Under the FWOP conditions, the proposed action would not occur and access to recreational resources would remain unchanged.

6 ENVIRONMENTAL CONSEQUENCES

When considering impacts, it was assumed that, at a minimum, best management practices (BMPs) identified throughout this chapter would apply during project construction. Assumed BMPs are based on widely accepted industry, state, and federal standards for construction activities. Examples include, but are not limited to:

- Use of silt fencing to limit soil migration and water quality degradation
- Refueling and maintenance of vehicles and equipment in designated areas to prevent accidental spills and potential contamination of water sources and the surrounding soils; and,
- Limiting idling of vehicles and equipment to reduce emissions

The environmental consequences for the proposed alternatives are described below. The consequences of the “No Action” Alternative were presented in the Future without Project Conditions chapter (Chapter 4).

6.1 LAND USE

Although the proposed alternatives may temporarily affect the use of the proposed project areas, there would be no changes in the land use of these areas. For instance, the detention area for the Golf Course, Kupulau, and Combination Alternatives would result in temporary inundation of the golf course and a baseball field located in the Kupulau project area. Although recreation activities would be impacted during flood events, these impacts would be temporary.

6.2 CLIMATE

Under each of the action alternatives, construction activities would generate greenhouse gas (GHG) emissions as a result of the combustion of fossil fuels while operating on- and off-road mobile sources. After construction is complete, all project related construction GHG emissions would cease and the area would return to baseline conditions. There are no apparent carbon sequestration impacts that would result from the implementation, thus the total direct and indirect impacts would be constrained to very small increases in GHG emissions to the atmosphere from the construction activities. These small increases would be far below the 25,000 metric ton per year threshold for discussion of GHG impacts (CEQ, 2014). In the years in which construction activities are implemented, emissions would incrementally contribute to global emissions, but would not be of such magnitude as to make any direct correlation with climate change.

6.3 WATER RESOURCES

The four action alternatives are all designed to alter the timing and magnitude of flows downstream of the project areas. The detention areas associated with the Golf Course, Kupulau, and Combination Alternatives would capture floodwaters from higher intensity flood events and mediate the flows of the water downstream. The stream impacts associated with alternatives would result in the extension of time when the intermittent streams would support flow as waters are released over a longer period of time from the detention basins. Because the stream bed of the creeks consist of lava bedrock, no adverse impacts due to erosion resulting from the higher flow velocity is anticipated. In addition, the increased inundation times for the streams would not affect the waterbodies as the form and function of the stream would remain unchanged.

6.3.1 FLOODPLAINS

The action alternatives would not adversely impact the floodplains within the project area. The alternatives are designed to reduce flood risk for the Hilo community; thereby decreasing the extent of the 1-percent floodplain. As much of the floodplain has been converted to urban uses, the environmental floodplain functions are already limited. Therefore, it is anticipated that adverse impacts to ecological floodplain functions would be minimal.

6.3.2 WETLANDS

There are no wetlands in the project areas for the final array of alternative; therefore, no impacts to wetland resources would occur from the implementation of the project.

6.3.3 SURFACE WATERS

For each of the alternatives, intermittent stream flow could be slightly altered if natural flow is interrupted during construction activities. However, construction activities would be planned to maintain a natural stream channel during the construction period. BMPs employed during construction (e.g. silt fencing, tarping/covering exposed and stockpiled soil, surface revegetation, etc.) would minimize impacts from storm water flow in the construction site and associated degradation of water quality. Each of the final array of alternatives would be completed in accordance with State and Federal regulations, including Section 404(b)(1) of the CWA.

Kupulau and Golf Course Alternatives: A four-foot diameter culvert would connect the Kupulau Detention Basin to Waiakea Stream. The construction of the culvert would impact less than a tenth of an acre of the Stream, a water of the U.S. The construction of the detention basin at the Hilo Golf Course would require the construction of a +/- 6.4-foot levee across Palai stream, ensuring normal flows would continue with the placement of two 6-foot diameter culverts. The construction of the levee would also result in the placement of fill material within less than a tenth of an acre of the Palai Streambed. Therefore, the impacts to Waters of the U.S. would be minimal and no compensatory mitigation would be required.

Under the Kupulau and Golf Course Alternatives, the storm water flows from the streams and the Kupulau Ditch would be captured by the floodwalls and levees and temporarily detained in the resulting detention basin. The detention basin would mediate stormwater flows into the Waiakea and Palai Streams, reducing flooding elevations downstream. The detention of the stormwaters would result in prolonged flows into the downstream portions of Waiakea and Palai Creeks as the basin drains after the rain event. However, the temporal increase of released flows would not be considered a significant impact on the stream resources.

Combination Alternative: The Combination Alternative would have the cumulative stream impact identified for each individual alternative listed above. The Combination Alternative would have a temporal impact on surface water resources; however, the cumulative impact of the project on the stream would not be considered significant.

6.3.4 GROUNDWATER

Because the estimated depth to groundwater is greater than 100 feet below the surface and the shallow depth of grading required to construct the alternatives, groundwater is not anticipated to be encountered. Under the FWP conditions for the final array of alternatives, there would be no anticipated impacts to groundwater.

6.4 WATER QUALITY

Construction activities associated with each of the action alternatives could temporarily affect water quality resulting from grading and excavation. BMPs employed during construction (e.g., silt fencing, tarping/covering exposed and stockpiled soils, surface revegetation, etc.) would minimize/eliminate storm water flow from the proposed construction site, and any associated degradation of water quality.

The Proposed Action would be completed in accordance with State and Federal regulations, including Section 404 (b)(1) of the CWA, which would further minimize any impacts to water quality in Waiakea Stream and Hilo Bay.

6.5 AIR QUALITY

Each of the alternatives would have relatively similar impacts to air quality. Ground disturbance could generate fugitive dust (e.g., PM) and use of construction equipment and personal vehicles to access the project area could lead to temporary increases in vehicular airborne pollutant concentrations.

These impacts would be temporary, and applicable BMPs, including silt fence and watering stockpiled soil, would be implemented. To reduce vehicle and equipment emissions, idling of vehicles and equipment would be minimized to the extent practicable and equipment would be maintained.

The CEQ requires a quantitative assessment of GHG emissions for activities that result in more than 25,000 tons of CO₂-equivalent per year. The final array of alternatives would contribute less than 25,000 tons of CO₂ into the atmosphere. With the possible exception of maintenance vehicles, each of the final array of alternatives is passive, with no further contribution of GHG.

6.6 GEOLOGIC RESOURCES

The proposed project would result in excavation of soils to a relatively shallow depth. No impacts on geologic resources are anticipated.

6.7 SOILS

The soils in the Golf Course alternative consist of Palaewa-Urban Land Complex soils. The Kupulau Alternative is located on Palaewa very cobbly hydrous loam. Neither of these soil types are prime farmland soils; therefore, the project alternatives would have no impact on prime farmland soils. No coordination with the NRCS is required.

6.8 FISH AND WILDLIFE RESOURCES

6.8.1 VEGETATION

Kupulau: The Kupulau Ditch Detention would include the construction of a series of three levees and one floodwall to create a detention basin to control floodwaters. The levees and floodwall would result in the conversion of approximately six acres of grassland and riparian vegetation into FRM features. Although the detention basin would be comprised of another six acres of maintained land associated with the baseball field, the frequency of flooding events and the short length of time the detention basin would be inundated is unlikely to result in adverse impacts to vegetation in the basin. The proposed alternative would not have any substantial adverse impacts to vegetation within the project area.

Golf Course: The golf course levee would convert approximately two acres of maintained golf course vegetation to FRM features. Approximately seven acres of the golf course would be temporarily inundated in the resulting detention basin. As with the alternative above, the flood frequency and detention time is unlikely to impact vegetation on the golf course. The proposed alternative would not have any substantial adverse impacts on vegetation within the project area.

Combination: The Combination Alternative would have the cumulative impact on vegetation of each of the previous alternatives. However, the cumulative impact on vegetation within the project area is not substantial.

6.8.2 AQUATIC RESOURCES

The final array of alternatives all occur within the intermittent portions of the Waiakea and Palai Streams. The FRM features of each of the alternatives would be designed to manage the higher flows associated with storm events, but also be designed to maintain lower flows associated with more frequent rainfall events. The levees and detention basins would not result in creating barriers for aquatic organisms immigrating/emigrating from downstream habitats to the upstream habitats. Minor short term adverse impacts to aquatic organisms may result during construction as significant rain events may displace soil from the construction site and increase turbidity in the streams. However, BMPs such as silt fence and temporary vegetation would minimize the water quality impacts to the aquatic biota. The effect of the FRM projects on aquatic resources may be of minor benefit to aquatic resources as the extended flows associated with the detention basins would prolong the time the streams flow allowing additional time for species to migrate to and from the higher reaches of the streams. No long-term adverse impacts to aquatic resources are expected.

6.8.3 TERRESTRIAL RESOURCES

Implementation of any of the final array of alternatives would have temporary, localized adverse impacts during construction, with some loss of less mobile species within the footprint of the levees. Mobile resident wildlife species would be temporarily displaced into adjacent habitats until construction activities were completed, with a minor loss of habitat associated with the approximately ten acres associated with the levee footprints. The maintained nature of these habitats associated with the levee footprints (baseball field, golf course, and maintained pasture) are not considered high quality habitats; therefore, there would be no substantial adverse impacts to terrestrial species resulting from the implementation of any of the alternatives.

6.8.4 THREATENED AND ENDANGERED SPECIES

A letter from USFWS dated 16 July 2008 in response to a request for an official threatened and endangered species list for the study area identified three species that may occur in the project area: the Hawaiian hoary bat, Hawaiian Hawk, and the Hawaiian Coot. No critical habitat for these, or any other endangered species, are located within the project areas.

There is a chance that Hawaiian hoary bats could utilize native and non-native woody plant species on the study area. However, most woody vegetation is located on the fringes of the project areas and would not be permanently impacted by the construction of the levees and floodwalls. The removal of woody vegetation would be limited to the extent practicable to minimize impacts to bat habitat. To eliminate impacts to bat roosting habitat, any woody vegetation that would need to be trimmed or removed would be done between August and April to avoid the birthing and pup rearing season for the bats. If the clearing of woody vegetation occurs between April and August, trees in the project area would be surveyed to determine the presence of hoary bats. If bats are observed, construction activities would cease until the USFWS has been consulted. The implementation of any of the final array of alternatives may affect, but is not likely to adversely affect the Hawaiian hoary bat.

Hawaiian hawks utilize grassland and forest habitats for foraging using trees to nest and perch while hunting. There is a chance that Hawaiian hawks could utilize native and non-native woody plant species on the study area. However, most woody vegetation is located on the fringes of the project areas and would not be permanently impacted by the construction of the levees and floodwalls. The removal of woody vegetation would be limited to the extent practicable to minimize impacts to the hawk habitat. The clearing of woody vegetation would occur between September and March to avoid the nesting season of the hawks. Should clearing of vegetation occur between March and September, nest surveys for the hawks will be conducted to ensure project activities do not affect breeding and nesting activities. During the nesting season, if an active nest is observed, construction activities would cease and the USFWS will be consulted. The implementation of any of the final array of alternatives may affect but is not likely to adversely affect the Hawaiian Hawk.

The Hawaiian Coot utilizes the wetland habitats surrounding Waiakea Pond in Hilo. Although the streams terminate into Waiakea Pond, the mediated flows would not substantially affect the wetland habitats of the pond. The implementation of any of the alternatives would allow base stream flows to continue downstream and would lessen the impacts of high velocity floodwaters entering the pond. Because the Hawaiian Coot habitat is located outside of the project areas and there would be no adverse indirect impacts to the coot's habitat, the project alternatives may affect but is not likely to adversely affect the Hawaiian Coot.

6.9 SPECIAL STATUS SPECIES

6.9.1 MIGRATORY BIRDS

Bird surveys conducted in 2010 identified 16 avian species utilizing the project area (USACE, 2010a). With the exception of the Pacific Golden-plover, all bird species were not native to Hawai'i and not subject to the MBTA. The Pacific Golden-plover winters on the Hawaiian Islands and migrates to Alaska to breed. During the winter, foraging habitat for the plovers consists of areas where the vegetation cover is short and sparse. Due to the lack of breeding and foraging habitat within the project areas, no substantial impacts to the Pacific Golden-plover are anticipated. Similarly, the low quality habitat of the project area decreases the likelihood of other native bird species to utilize the habitat for nesting or foraging.

6.9.2 MARINE MAMMALS

Alternatives included in the final array include FRM measures approximately three miles from Hilo Bay. The stream length from the project areas to Hilo Bay more than three miles as the stream meanders increase the distance the stream travels. Because the FRM measures incorporated in the final array of alternatives would not substantially affect the quantity of environmental flows and would not increase sediment loading into the Bay, no substantial adverse impacts to marine mammals is anticipated.

6.9.3 ESSENTIAL FISH HABITAT

Similar to the marine mammal conditions described above, EFH resources would not be impacted by environmental flows and sedimentation into the Bay. The NMFS was invited to participate in a site visit to the study area on 27 February 2019, but did not participate citing the lack of potential impacts the study would have on EFH resources. As discussed in the Aquatic Resources Chapter (6.8.2), the extended inundation of the streams may have a slight benefit for diadromous organisms allowing extended periods of time for the fish to transition between habitats. The study area is located in

freshwater tributaries inland of navigable waters and is absent designated EFH. The Recommended Plan would have no effect on designated EFH located downstream of the study area.

6.9.4 COASTAL ZONE MANAGEMENT

USACE applied for and obtained a Federal Consistency Determination from the State Office of Planning, Coastal Zone Management Office on September 14, 2020 (Attachment 3). The State CZM Office concurred that the proposed alternatives are compatible, consistent, and not conflict with any of the objectives of the CZM program and would not adversely impact coastal recreation opportunities, impede economic uses, increase coastal hazards, or conflict with development within the coastal zone. All conditions of the State's Federal Consistency Determination will be implemented in the design and construction phase to ensure consistency with the State CZM program.

6.10 CULTURAL RESOURCES

There are no known culturally significant traditional properties or resources in the study area. In addition, the area does not support any cultural practices. Therefore, the Recommended Plan would not impact any of these resources. Appendix C includes additional information regarding Cultural Resources coordination.

6.11 SOCIOECONOMICS

Kupulau Alternative: Based on the U.S. Census data and field observations, the implementation of the Kupulau Alternative would not have a disproportionate adverse impact on specific racial, ethnic, or socioeconomic group living in the vicinity of the project area and would not adversely impact environmental justice populations.

Children would be expected to concentrate at the New Hope Church and the adjacent baseball field. Measures would be incorporated to ensure the safety of children in the project area such as exclusion fencing, signage, and securing construction equipment. With these mitigative measures in place, the alternative would not have substantial adverse impacts on the local population of children.

Golf Course Alternative: Based on the U.S. Census data and field observations, the implementation of the Golf Course Alternative would not have a disproportionate adverse impact on specific racial, ethnic, or socioeconomic group living in the vicinity of the project area and would not adversely impact environmental justice populations.

The Golf Course Alternative would be implemented within an access controlled facility. In addition, children on the golf course would need to be accompanied by an adult; therefore there would be no adverse impacts to children as it relates to EO 13045 as long as the mitigative measures identified for the Kupulau Alternative in the text above are implemented.

Combination Alternative: The Combination Alternative would have the cumulative impact of the three alternatives described above. None of the project areas of the previous three alternatives have a disproportionate impact on racial, ethnic, or low income populations and the cumulative impacts are no different. With the appropriate mitigation measures in place, the Combination Alternative would not have an adverse impact on the safety and welfare of children.

6.12 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

In the short-term, the Proposed Action may generate solid waste from the clearing of vegetation and unused construction materials in the proposed project area. During construction of the Proposed Action, the contractor would be responsible for such solid waste disposal. In the long-term, the Proposed Action would require infrequent solid waste disposal of cleared debris, in accordance with applicable regulations. Overall, implementation of the Proposed Action is expected to have a less than significant impact on solid waste generation in the affected environment for the foreseeable future.

During construction of the Proposed Action, there may be the potential of petroleum and petroleum-related products spillage associated with construction vehicles and equipment. To minimize this hazard, all applicable County of Hawaii Spill and Prevention Control BMPs would be implemented to ensure that accidental releases are minimized and contained. For example, vehicles and equipment would be regularly inspected for leaks and performance and maintained accordingly to prevent spills from occurring. Any potentially hazardous materials required for the project or any resultant hazardous waste will be managed and disposed of in compliance with all applicable state and federal regulations, including RCRA. In the long term, the potential for petroleum spillage exists from maintenance vehicles. Again, all applicable County of Hawaii Spill and Prevention Control BMPs would be implemented. Implementation of the Proposed Action is expected to have less than significant solid waste generation in the affected environment for the foreseeable future.

6.13 NOISE

For each of the alternatives in the final array, short-term noise impacts from construction activities may occur. A Noise Impact Assessment Report was conducted for the project in December 2008 to identify current conditions and to analyze potential impacts from construction work associated with the flood control project (Y. Ebisu & Associates, 2008). The baseline noise levels of the area are consistent with a suburban environment; ambient noise levels were recorded to be between 40 and 58 dBA. It was determined that adverse impacts from construction noise were not expected to be significant due to the temporary nature of the work as well as administrative controls.

The sensitive receptors closest in proximity to the proposed project area are residences, church, and golf course located in the immediate vicinity of the flood management features. Construction-related noise would be generated from equipment and vehicles. However, noise exposure from construction activities would not be continuous at any one location throughout the entire construction process and BMPs would be implemented to reduce or eliminate noise. Buffer zones between construction activities and sensitive receptors would be created, and construction work would be limited to the hours between 7:30am and 3:30pm on weekdays. In addition, sound barriers, mufflers, and other structures would be erected to reduce noise levels if they exceed Federal and State standards. Heavy truck and equipment staging areas would be located as far from noise sensitive properties as possible. As a result, short-term impacts from construction activities would be less than significant to the surrounding environment.

Upon completion, the Proposed Action would not be a source of any significant long-term noise generation. The only indirect noise generated from the Proposed Action in the long-term would be from maintenance vehicles infrequently clearing accumulated debris after significant flood events. However, the noise type and levels would be consistent with those already present in the Hilo suburban environment. Therefore, long-term noise impacts are expected to be less than significant.

6.14 VISUAL AESTHETICS

For each of the final array of alternatives, the visual aesthetic impacts would be temporary during the construction of the FRM features. However, the study area is moderately urbanized and the equipment would be isolated within the project area and staging areas. No equipment would be placed within park, beach, or scenic vista areas. Therefore, the temporary visual aesthetic impacts of each alternative would not be substantial.

Once construction of the FRM structures for any of the alternatives is completed, changes in the landscape would result from the installation of levees and floodwalls. The maximum levee height for any of the alternatives is 10 feet above grade and the Kupulau floodwall would be 5 feet above grade.

The proposed FRM features would blend in with the maintained grassland landscape and would not adversely contrast the aesthetic of the surrounding visual environment. The proposed alternatives would also be compatible with the County's General Plan as the FRM features would not obstruct the views of the volcanos, bays, or other significant visual resources. Therefore, none of the final array of alternatives would adversely affect the aesthetic environment.

6.15 RECREATION

Kupulau Alternative: During the construction of the Kupulau Alternative, construction activities and the operation of heavy machinery would temporarily close the baseball field located to the north of the New Hope Church. After construction, the baseball field would be returned to preconstruction conditions and the field would be located within the floodwater retention basin. Periodically, the ball field would be impacted as floodwaters filled the detention basin, limiting access to the fields. As water is retained and the ground saturated, there may be a delay in resuming the use of the ball field. However, due to the flashiness of Waiakea Stream, the ball field would not be inundated a significant amount of time, so these impacts would not be considered a substantial adverse impact.

Golf Course Alternative: The Golf Course Alternative entails the construction of a levees and detention basin on the Hilo Municipal Golf Course. During construction, golfing opportunities would be restricted during construction. Similar to the Kupulau Alternative above, golfing opportunities would be limited during periods of flooding when the detention basin was inundated; however, the basin is anticipated to drain relatively quickly. The constructed levee would be designed in cooperation with the County to ensure that the levee is integrated with the golf course features. Therefore, the Golf Course Alternative would not have substantial impacts on recreational resources.

Combination Alternative: The Combination Alternative would have the cumulative recreation resource impacts of the Kupulau and Golf Course Alternatives. The cumulative recreational impacts would not have a substantial impact on recreational resources in the project area.

7 CUMULATIVE IMPACTS

This section presents the cumulative impacts of the Recommended Plan. NEPA regulations require that cumulative impacts of the proposed action be assessed and disclosed in an Environmental Impact Statement (EIS) or EA. CEQ regulations define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably future actions regardless of what agency (federal or non-federal) or person undertakes such

other actions.” Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

NEPA guidance (40 CFR 2508.25) identifies resources that would be considered in a cumulative impacts analysis that should be evaluated in an EIS or EA. For an action to have a cumulative action on a resource, the action must have a direct or indirect effect on that resource, unless that resource is in declining or in a significantly impaired condition. Even though a direct or indirect impact on a resource may not be significant, the cumulative impact of the project on that resource in combination with other past, present, and future projects outside of the federal action may be cumulatively significant. Therefore, an analysis must be conducted to assess the contribution of any significant direct or indirect impacts to the overall cumulative trends in resource health.

From a review of the likely environmental impacts analyzed in **Chapter 5** (Future without Project Conditions) and this chapter (Environmental Consequences), USACE determined that there would be minimal direct or indirect impacts to the human and natural environment and no resources of significant decline were identified within the project areas. Therefore, according to CEQ guidance, no cumulative impacts analysis is required.

8 ENVIRONMENTAL COMPLIANCE

Federal projects must comply with Federal and State environmental laws, regulations, policies, rules, and guidance. The IFR/EA is compliant with NEPA, HRS 343, and ER 200-1-1 (Environmental Quality: Policy and Procedures for Implementing NEPA, 33 CFR 230). Significant coordination with local, state, and federal resource agencies has occurred from the beginning of the feasibility study. In implementing the Recommended Plan, USACE would follow provisions of all applicable laws, regulations, and policies related to the proposed actions. The status of compliance with environmental laws is presented below (**Table 7**). The following sections present summaries of federal environmental laws, regulations, and coordination requirements to this study.

Table 7: Environmental Compliance Status of the Waiakea-Palai Stream FRM Study

Policies	Compliance Status	Notes
Public Laws		
Abandoned Shipwrecks Act of 1988, as amended	Not Applicable	
Archeological and Historic Preservation Act of 1974, as amended	In Progress	Section 7.1.3, Attachment 4
Bald and Golden Eagle Protection Act of 1940, as amended	Not Applicable	
Clean Air Act of 1970, as amended	Compliant	Section 7.1.2
Clean Water Act of 1972	Compliant/In Progress	Section 7.1.1 Attachment 2

Coastal Barrier Resources Act of 1982, as amended	Not Applicable	
Coastal Zone Management Act of 1972, as amended	Compliant	Section 5.9.4, Attachment 3
Endangered Species Act of 1973, as amended	Compliant	Section 7.1.4, Attachment 1
Farmland Protection Policy Act of 1981	Compliant	Section 5.7
Fish and Wildlife Coordination Act of 1934, as amended	Compliant	Attachment 5
Magnuson-Stevens Fisheries Conservation and Management Act of 1976, as amended	Compliant	Section 5.9.3
Marine Mammal Protection Act of 1972, as amended	Compliant	Section 5.9.2
Marine Protection, Research, and Sanctuaries Act of 1972, as amended	Not Applicable	
Migratory Bird Treaty Act of 1918, as amended	Compliant	Section 7.1.8
National Environmental Policy Act of 1970, as amended	In Progress	
National Historic Preservation Act of 1966, as amended	In Progress	Section 7.1.3, Attachment 4
Native American Graves Protection and Repatriation Act of 1990	Not Applicable	Section 7.1.3, Attachment 4
Rivers and Harbors Act of 1899, as amended	Not Applicable	
Wild and Scenic Rivers Act, as amended	Not Applicable	

Executive Orders

Environmental Justice (E.O. 12898)	Compliant	Section 7.1.9
Flood Plain Management (E.O. 11988)	Compliant	Section 7.1.7
Protection of Wetlands (E.O. 11990)	Compliant	Section 5.3.2
Protection of Children from Environmental Health Risks (E.O. 13045)	Compliant	Section 7.1.10
Invasive Species (E.O. 13112)	Compliant	Section 7.1.6
Migratory Birds (E.O. 13186)	Compliant	Section 7.1.8

8.1 ENVIRONMENTAL COMPLIANCE DISCUSSION

The following sections present summaries of federal environmental laws, regulations, and coordination requirements to this study.

8.1.1 CLEAN WATER ACT

8.1.1.1 SECTION 404

USACE, under the direction of Congress, regulates the discharge of dredged and fill materials into waters of the U.S., including wetlands pursuant to Section 404 of the CWA. USACE does not issue itself permits for construction activities affecting waters of the U.S., but must meet the legal requirements of the Act. The Waiakea Stream is the only water of the U.S. subject to CWA jurisdiction within the project area. Based on the feasibility level of design, no discharges of dredged or fill material into the Waiakea Stream is proposed. However, further detail will arise in the design phase regarding construction means and methods that may propose a Section 404 discharge into the Waiakea Stream. If, in the design phase, a Section 404 discharge is proposed, then a Section 404(b)(1) analysis will be conducted for the discharge, when sufficient information regarding the discharge(s) is available and in conjunction with applying for a Water Quality Certification.

8.1.1.2 SECTION 402

Construction activities that disturb upland areas (land above Section 404 jurisdictional waters) are subject to the NPDES requirements of Section 402(p) of the CWA. Within Hawaii, DOH is the permitting authority and administers the federal NPDES program. Construction activities that disturb one or more acres are subject to complying with the NPDES requirements. Operators of construction activities that disturb five or more acres must prepare a Storm Water Pollution Prevention Plan (SWPPP), submit a Notice of Intent to DOH, conduct onsite posting and periodic self-inspection, and follow and maintain the requirements of the SWPPP.

During construction, the operator shall ensure that measures are taken to control erosion, reduce litter and sediment carried offsite (silt fences, hay bales, sediment retention ponds, litter pickup, etc.), promptly clean up accidental spills, utilize BMPs onsite, and stabilize against erosion before completion of the project.

8.1.1.3 SECTION 401

Section 401 of the Clean Water Act requires any applicant for a federal permit, for any discharges into waters of the U.S., obtain from the State a certification that the proposed discharges are consistent with the State water quality standards. USACE has determined, in coordination with the State of Hawaii Department of Health, Clean Water Branch (CWB), that the level of detail regarding the proposed discharges is inadequate to successfully apply for and obtain a Water Quality Certification (WQC) from the State of Hawaii CWB. USACE met with CWB on November 23, 2020 to discuss the feasibility study and propose the Corps' plan to apply for a WQC during the design phase. USACE followed up after the meeting with a letter dated December 8, 2020 to the CWB documenting the meeting and requesting confirmation of the Corps' plan to comply with the CWA during the feasibility and design phases. The CWB issued a letter of confirmation on December 14, 2020 acknowledging coordination with USACE, indicating a preliminary determination of no issue with USACE moving forward into design and

concurring upon the Corps' plan to apply for a Section 401 WQC during the design phase when adequate information is available to do so, and prior to construction (Attachment 2). All conditions and avoidance and minimization measures of any WQC issued for this project will be implemented to ensure compliance with the State Water Quality Standards.

8.1.2 CLEAN AIR ACT

Federal agencies are required by this Act to review all air emissions resulting from federally funded projects or permits to insure conformity with the SIPs in non-attainment areas. The Hilo/Wiaakea-Palai Stream area is currently in attainment for all air emissions; therefore, the proposed project would be in compliance with the Clean Air Act.

8.1.3 NATIONAL HISTORIC PRESERVATION ACT OF 1966

Federal agencies are required under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, to "take into account the effects of their undertakings on historic properties" and consider alternatives "to avoid, minimize, or mitigate the undertaking's adverse effects on historic properties" [(36 CFR 800.1(a-c)] in consultation with the State Historic Preservation Officer (SHPO) and appropriate federally recognized Indian Tribes (Tribal Preservation Officers – THPO)[(36 CFR 800.2(c)]. There are other applicable cultural resource laws, rules, and regulations that will inform how investigations and evaluations will proceed throughout the study and implementation phases (e.g., Archeological and Historic Preservation Act of 1974, NEPA, Native American Graves Protection and Repatriation Act, and ER 1105-2-100).

In accordance with Section 106 of the NHPA, USACE consulted with the Hawaii SHPO (there are no recognized Native American tribes in Hawaii) regarding the potential to impact properties from the proposed undertaking (**Attachment 4**). There are no known culturally significant traditional properties or resources in the study area. In addition, the area does not support any cultural practices. Therefore, no further consultation is required.

8.1.4 ENDANGERED SPECIES ACT

In the early planning stages of this study, USACE initiated consultation with the USFWS by letter dated November 1, 2016, requesting concurrence on the USACE determination that the proposed action may affect, but is not likely to adversely affect the Hawaiian hoary bat, Hawaiian Hawk, and the Hawaiian Coot. By letter dated June 8, 2018, the USFWS concurred with the USACE determination and also informed USACE that the project area consists of intermittent streams with exposed bedrock that harbors no permanent aquatic biota and that the surrounding trees lack the height and breadth necessary to support the Hawaiian hawk. USACE sought further technical assistance pursuant to the Fish and Wildlife Coordination Act from the USFWS and NMFS regarding potential impacts to threatened and endangered species within the project area. Dan Polhemus (USFWS) participated in a site visit to the study area on 27 February 2019; due to the absence of ESA or EFH resources in the proposed action areas under NMFS' jurisdiction, NMFS did not participate in the site visit. No endangered species or their habitats were observed within the project areas and Mr. Polhemus verbally supported the USACE determination that the proposed action may affect but is not likely to adversely affect listed species. The proposed action is in compliance with the ESA.

8.1.5 FARMLAND PROTECTION

8.1.6 FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act (FWCA) requires federal agencies that are impounding, diverting, channelizing, controlling, or modifying the waters of any stream or other water body to consult with the USFWS and appropriate state fish and game agency to ensure that wildlife conservation receives equal consideration in the development of such projects. The Corps invited USFWS to a site visit on 27 February 2019 and to inform the USFWS' drafting of a FWCA report to assist the Corps in planning the design for this project. During the site visit, Mr. Polhemus stated that due to the urbanized nature of the project area and the lack of native natural resources, that a full Fish and Wildlife Coordination Act Report would not be required. The USFWS returned to the Corps a FWCA Planning Aid Report dated 18 February 2020 (Attachment 5), recommending implementation of the following standard best management practices (BMPs) designed to avoid and minimize adverse effects to riparian and marine ecosystems located downstream of the project area:

(1) (USACE) should make every effort to develop and implement a plan for conducting all anticipated work involving stream channels during the summer dry season. Work should be ceased and re-scheduled in the event of an out-of-season heavy rainfall;

(2) Avoid conducting construction or subsequent maintenance activities that will lead to mid- and long-term destabilization and exposure of bare sediment along the stream banks or in the stream bed;

(3) No debris, petroleum projects, or deleterious materials or wastes shall be allowed to fall, flow, leach, or otherwise enter any waters of the United States;

(4) All authorized activities shall be done in a manner to confine and isolate the construction activity and to control and minimize any turbidity that may result from in-water work. Silt curtains or other appropriate and effective silt containment devices approved by the USACE shall be used to minimize turbidity and shall be properly maintained throughout the entire period of any in-water work to prevent the discharge of any material to the downstream aquatic habitat. All sediment control devices installed as BMPs (i.e., fabric sandbags, silt curtains/screens, etc.) downstream or makai of the authorized work shall remain in place until the in-water work is completed and will be removed in their entirety and disposed of at an appropriate upland location once the water quality of the affected area has returned to its pre-construction condition;

(5) Return flow or runoff from upland dewatering site(s)/disposal site(s) shall be contained on land and shall not be allowed to discharge and/or re-enter any waters of the United States;

(6) No sidecasting or stockpiling of excavated materials in the aquatic environment is authorized. All excavated materials shall be placed above the ordinary high water mark of any designated waters of the United States, or disposed of in an upland location. The permittee shall demonstrate that there is no reasonable expectation that disposal locations adjacent to high tide lines on the ocean, or in floodplains adjacent to other rivers or streams, would result in the material being eroded into the nearby waterbody by high tides and/or flood events;

(7) Warning signs shall be properly deployed and maintained until the portion of the in-water work is completed and the affected area water quality has returned to its preconstruction condition and turbidity control devices have been removed from the waterway;

(8) Fueling, repair, and other activities with any potential to release pollutants will occur in a location where there is no potential for spills to have an effect on waters of the United States;

(9) When the USACE is notified that an authorized activity is detrimental to fish and wildlife resources, the USACE will issue a suspension order until all pertinent issues have been satisfactorily resolved. The construction contractor shall comply with any USACE-directed remedial measures deemed necessary to mitigate or eliminate the adverse effect.

The USFWS concluded that due to the absence of surface flow in the areas associated with the project footprints, the apparent absence of diadromous aquatic macrofauna in the headwater reaches above the project footprint, and the overwhelmingly non-native composition of the flora and fauna in the areas of suburban Hilo, USFWS does not consider that the Preferred Alternative with implementation of the above standard BMPs will have any significant or deleterious impacts to trust resources. Additionally, USFWS stated that the Planning Aid Report is sufficient to cover the Feasibility Study phase of the current project and as the project progresses to design and eventual construction, USACE should continue to coordinate with USFWS in order to avoid or minimize any potential environmental effects.

The Corps will insert the USFWS standard BMPs into any construction contract as a requirement for any construction contractor to implement and will coordinate any proposed modification to the preferred alternative with the USFWS. By email dated 8 February 2021 to the USFWS, the Corps accepted the FWCA Planning Aid Report in its entirety, including acceptance of the standard BMPs and trigger to reinitiate FWCA consultation..

8.1.7 EXECUTIVE ORDER 13112, INVASIVE SPECIES

EO 13112 recognizes the significant contribution native species make to the well-being of the nation's natural environment and directs federal agencies to take preventative and responsive action to the threat of the invasion of non-native species. The EO establishes that federal agencies "will not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

The habitat impacted by the proposed action is dominated with non-native species. Construction activities will implement BMPs to ensure that the spread of the non-native species outside of the project area is avoided/minimized.

8.1.8 EXECUTIVE ORDER 13690, ESTABLISHING A FEDERAL FLOOD RISK MANAGEMENT STANDARD AND A PROCESS FOR FURTHER SOLICITING AND CONSIDERING STAKEHOLDER INPUT; AND AMENDMENT TO EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

EO 13690 was enacted on January 30, 2015 to amend EO 11988 , enacted May 24, 1977, in furtherance of the NEPA of 1969, as amended (42 U.S.C. 4321 et seq.), the National Flood Insurance Act of 1968, as

amended (42 U.S.C. 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat.975). The purpose of the EO 11988 was to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The EO 13690 builds on EO 11988 by adding climate change criteria into the analysis.

These orders state that each agency shall provide and shall take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. The FEMA Digital Flood Insurance Rate Map (DFIRM) of the study area was analyzed to establish the locations of the 100-year and 500-year flood zones. All alternatives were designed to reduce flood risk to the Hilo community. The proposed action would remain in compliance with EO 11988 and EO 13690.

8.1.9 MIGRATORY BIRD TREATY ACT, MIGRATORY BIRD CONSERVATION ACT, AND EXECUTIVE ORDER 13186, MIGRATORY BIRDS

The importance of migratory non-game birds to the nation is embodied in numerous laws, executive orders, and partnerships. The Migratory Bird Treaty Act demonstrates the federal commitment to conservation of non-game species. Amendments to the Act adopted in 1988 and 1989 direct the Secretary to undertake activities to research and conserve migratory non-game birds. EO 13186 directs federal agencies to promote the conservation of migratory bird populations, including restoring and enhancing habitat. Migratory Non-Game Birds of Management Concern is a list maintained by the USFWS. The list helps fulfill the primary goal of the USFWS to conserve avian diversity in North America. The USFWS Migratory Bird Plan is a draft strategic plan to strengthen and guide the agency's Migratory Bird Program. The proposed action would not adversely affect migratory birds and is in compliance with the applicable laws and policies.

8.1.10 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

EO 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" dated February 11, 1994, requires all federal agencies to identify and address disproportionately high and adverse effects of its programs, policies, and activities on minority and low-income populations. Data was compiled to assess the potential impacts to minority and low-income populations within the study area. Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Even though minorities account for a large portion of the local population and the low-income population is above the national averages, construction of the proposed alternatives would not have a disproportionately high or adverse effect on these populations.

8.1.11 EXECUTIVE ORDER 13045, PROTECTION OF CHILDREN

The EO 13045 "Protection of Children from Environmental Health Risks" dated April 21, 1997 requires federal agencies to identify and address the potential to generate disproportionately high

environmental health and safety risks to children. This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults.

Short-term impacts on the protection of children would be expected. Numerous types of construction equipment such as backhoes, bulldozers, dredgers, graders, and dump trucks, and other large construction equipment would be used throughout the duration of the construction of the proposed action. Because construction sites and equipment can be enticing to children, activity could create an increased safety risk. The risk to children would be greatest in construction areas near densely populated neighborhoods. During construction, safety measures would be followed to protect the health and safety of residents as well as construction workers. Barriers and “No Trespassing” signs would be placed around construction sites to deter children from playing in these areas, and construction vehicles and equipment would be secured when not in use. Since the construction area would be flagged or otherwise fenced, issues regarding Protection of Children are not anticipated.

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ATTACHMENTS

Attachment 1: U.S. FISH AND WILDLIFE SERVICE ESA INFORMAL CONSULTATION CORRESPONDENCE



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:
01EPIF00-2008-SL-0264, 0265, 0266
01EPIF00-2017-I-0039

June 8, 2018

Mr. Michael Wyatt
Department of the Army, Honolulu District
U.S. Army Corps of Engineers
Fort Shafter, Hawaii 96858

Subject: Informal Consultation for Waiakea Flood Control Project, Hilo, island of Hawaii

Dear Mr. Wyatt:

The U.S. Fish and Wildlife Service (Service) received your letter dated November 1, 2016, requesting our concurrence with your determination that the Waiakea Flood Control Project for several streams in Hilo, Hawaii may affect, but is not likely to adversely affect the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian coot (*Fulicia americana alai*), or Hawaiian hawk (*Buteo solitarius*). Our office recently discovered that this request was never addressed and reached out to you to ensure action was still warranted. During a phone call on May 23, 2018, Jodi Charrier (Service) confirmed with Mr. Michael Wyatt (U.S. Army Corps of Engineers [Corps]) that though the project has been on hold for over a year, it will be moving forward shortly and a Section 7 consultation is still needed. We apologize for our delay and appreciate your patience. This response is being provided pursuant to the Endangered Species Act (ESA) of 1973 [16 U.S.C. 1531-1544 *et seq.*], as amended.

Project description

The Corps is proposing to reduce flood risks associated with the Waiakea and Palai Streams located in Hilo, Hawaii. The project entails construction of detention basins and diversion structures and installation of new culverts. There is no concrete lining of streams proposed. Where the detention or diversion structures would cross a stream, stream flow will not be blocked and culverts will allow for stream flow and fish passage. The project site along Waiakea Stream is approximately 4.5 miles upstream from the ocean. The project sites along Palai Stream are approximately 3.25 and 4.5 miles upstream from the ocean. There is potential for sedimentation, turbidity from the construction to be dispersed downstream as it flows towards Hilo Bay. Best management practices to minimize sedimentation, turbidity or contaminants downstream will be implemented.

Biological surveys completed by the Corps in 2010 (*Flora and Fauna Surveys for the Waiakea Flood Control Project in Hilo, Hawaii, AECOS, Inc., March 17, 2010*), found no threatened or endangered species in the project areas.

The conservation measures enumerated below were included in your proposed project description to avoid and minimize impacts to the Hawaiian hoary bat which may occur within the action area of the proposed project. These avoidance and minimization measures are considered part of the project description. Any changes to, modifications of, or failure to implement these avoidance and minimization measures may result in the need to reinitiate this consultation.

Hawaiian hoary bat

No removal or trimming of any woody plant material greater than 15 feet tall will be conducted during the breeding season (June 1 to September 15).

Hawaiian coot

No Hawaiian coots were found during previous surveys and none are expected to be located within action area due to the lack of suitable habitat.

Hawaiian hawk

None found during previous surveys and none expected to be affected within action area due to the lack of suitable habitat.

Rapid Ohia Death

Rapid Ohia Death (ROD), a newly identified disease, has killed large numbers of mature ohia trees (*Metrosideros polymorpha*) in forests and residential areas of Hawaii Island. The disease is caused by a vascular wilt fungus (*Ceratocystis fimbriata*). Crowns of affected trees turn yellowish or brown within days to weeks and dead leaves typically remain on branches for some time. All ages of ohia trees can be affected and can have symptoms of browning of branches or leaves. As of early 2015 the disease was confined to Hilo and the Puna district on Hawaii Island, but has since been confirmed in Volcano, South Kona, and Hamakua districts. Additional information on ROD can be found at <http://www2.ctahr.hawaii.edu/forestry/downloads/ROD-trifold-03.2016.pdf> and http://www2.ctahr.hawaii.edu/forestry/disease/ohia_wilt.html.

The following avoidance and minimization measures will be followed this project:

- A survey of the proposed project site will be conducted within two weeks prior to any tree cutting to determine if there are any infected ohia trees. If infected ohia are suspected at the site, the following agencies will be contacted for further guidance.
 - USFWS – please contact the name at the bottom of this letter
 - Dr. J.B. Friday, University of Hawaii Cooperative Extension Service, 808-969-8254 or jbfriday@hawaii.edu
 - Dr. Flint Hughes, USDA Forest Service, 808-854-2617, fhughes@fs.fed.us
 - Dr. Lisa Keith, USDA Agriculture Research Service, 808-959-4357, Lisa.Keith@ars.usda.gov

- Both prior to cutting ohia and after the project is complete:
 - Tools used for cutting infected ohia trees will be cleaned with a 70 percent rubbing alcohol solution. A freshly prepared 10 percent solution of chlorine bleach and water can be used as long as tools are oiled afterwards, as chlorine bleach will corrode metal tools. Chainsaw blades will be brushed clean, sprayed with cleaning solution, and run briefly to lubricate the chain.
 - Vehicles used off-road in infected forest areas will be thoroughly cleaned. The tires and undercarriage of the vehicle will be cleaned with detergent if they have travelled from an area with ROD or travelled off-road.
 - Shoes and clothing used in infected forests will also be cleaned. Shoes will be decontaminated by dipping the soles in 10 percent bleach or 70 percent rubbing alcohol to kill the ROD Fungus. Other gear can be sprayed with the same cleaning solutions. Clothing can be washed in hot water and detergent.
- Wood of affected ohia trees will not be transported to other areas of Hawaii Island or interisland. All cut wood will be left on-site to avoid spreading the disease. The pathogen may remain viable for over a year in dead wood. The HDOA has passed a new quarantine rule that prohibits interisland movement, except by permit, of all ohia plant or plant parts.

Conclusion

The streams included in your project description are both intermittent bedrock channels that do not harbor any permanent aquatic biota. Therefore, there is not sufficient habitat in the project area to support the Hawaiian coot. The ohia trees that may be removed from the area are too small to be considered nesting habitat for the Hawaiian hawk and your project actions are not expected to adversely affect this species. Based on the inclusion of the above avoidance and minimization measures for the Hawaiian hoary bat and the unlikelihood of the Hawaiian coot or Hawaiian hawk to be nesting or found in the action area, we found the potential effects to these species to be discountable because they are unlikely to occur. Therefore, the Service concurs with your determination that this proposed project may affect, but is not likely to adversely affect these listed species. Unless the project description changes, or new information reveals that the proposed project may affect listed species in a manner or to an extent not considered, or a new species is listed or critical habitat designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary.

Thank you for your efforts to conserve listed species and native habitats. Please contact Endangered Species Biologist Jodi Charrier (jodi_charrier@fws.gov or (808)342-6607 if you have any questions or for further guidance.

Sincerely,

MICHELLE BOGARDUS Digitally signed by MICHELLE BOGARDUS Date: 2018.06.08 09:21:02 -10'00'

Michelle Bogardus
Island Team Leader
Maui Nui and Hawaii Island

Attachment 2: STATE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH LETTER OF CONFIRMATION

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

ELIZABETH A. CHAR, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EMDCWS

12014PDCL.20

December 14, 2020

Ms. Jennifer Moore, PMP
Deputy District Engineer for
Programs and Project Management
Department of the Army
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaii 96858-5440

Dear Ms. Moore:

**Subject: Waiakea and Palai Streams Feasibility Study
November 23, 2020 Coordination Meeting**

Reference is made to your letter of December 8, 2020. The Department of Health (DOH), Clean Water Branch (CWB) confirms attending the subject coordination meeting with the U.S. Army Corps of Engineers (USACE), Civil and Public Works Branch.

Pursuant to Clean Water Act (CWA), Section 401 (33 USC § 1341), the USACE must obtain a Section 401 Water Quality Certification (WQC) from the DOH-CWB for the proposed discharge. The DOH-CWB acknowledges that the details of the feasibility level of conceptual design are inadequate to identify and describe the proposed discharges with sufficient detail to apply for and obtain a Section 401 WQC from the DOH-CWB. Although insufficient detail exists at the feasibility stage for USACE to apply and obtain a Section 401 WQC from DOH-CWB, DOH-CWB has no preliminary issues, based on information available at this time, with the USACE moving forward with further designs of this project. We acknowledge that USACE will seek a Section 401 WQC from DOH-CWB when sufficient detail is available. A Section 401 WQC must be obtained prior to construction

If you have any questions, please contact Mr. Darryl Lum of the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

A handwritten signature in cursive script that reads "Alec Wong".

ALEC WONG, P.E., CHIEF
Clean Water Branch

c: Mr. Jeffrey Herzog, USACE [via e-mail Jeffrey.a.herzog@usace.army.mil only]
Ms. Jessie Paahana, USACE [via e-mail Jessie.K.Paahana@usace.army.mil only]

Attachment 3: COASTAL ZONE MANAGEMENT DETERMINATION



**OFFICE OF PLANNING
STATE OF HAWAII**

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR
OFFICE OF PLANNING

DTS 202009091053NA

September 14, 2020

Mr. Stephen N. Cayetano, P.E.
Deputy District Engineer for
Programs and Project Management
U.S. Army Corps of Engineers, Honolulu District
Fort Shafter, Hawaii 96858-5440

Attention: Ms. Jessie Paahana, Civil and Public Works Branch

Subject: Hawaii Coastal Zone Management Program Federal Consistency Review of
Waiakea-Palai Streams Flood Risk Management Feasibility Study, Hilo, County
of Hawaii

The Hawaii Coastal Zone Management (CZM) Program has completed the federal consistency review for the U.S. Army Corps of Engineers Waiakea-Palai Streams Flood Risk Management Feasibility Study, Hilo, County of Hawaii. This federal consistency review covers the proposed activity as it is represented as the "Recommended Plan" in the Final Integrated Feasibility Report and Environmental Assessment (Final FR/EA), May 2020, that was included as supporting information for the consistency determination. We conditionally concur with the Corps' determination that the proposed activity is consistent to the maximum extent practicable with the enforceable policies of the Hawaii CZM Program. The following conditions shall apply to this consistency concurrence:

1. The proposed activity shall be completed as represented in the CZM federal consistency determination. Any changes to the proposal shall be submitted to the Hawaii CZM Program for review and approval. Changes to the proposal may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed activity is carried out as reviewed for consistency with the enforceable policies of the Hawaii CZM Program. Hawaii Revised Statutes (HRS) Chapter 205A Coastal Zone Management, is the federally approved enforceable policy of the Hawaii CZM Program that applies to this condition.
2. The State Department of Land and Natural Resources, Commission on Water Resources Management (CWRM), indicated in a letter (August 24, 2020, enclosed) providing comments to the Hawaii CZM Program, that a "Stream Channel Alteration Permit is required before any alteration can be made to the bed and/or banks of a

stream channel.” Therefore, the County of Hawaii Department of Public Works, as the non-federal sponsor for the proposed activity, shall obtain a Stream Channel Alteration Permit, or waiver, from the CWRM, before any alteration can be made to the bed and/or banks of any of the stream channels included in the proposed activity. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies HRS Chapter 174C State Water Code, and Hawaii Administrative Rules (HAR) Chapter 13-169 Protection of Instream Uses of Water.

3. To mitigate potential adverse effects to water quality, the best management practices represented in the Final FR/EA (p. 27), shall be employed during construction (e.g., sediment erosion control barriers such as silt fencing, tarping/covering exposed and stockpiled soils, surface revegetation, etc.) to “minimize/eliminate storm water flow from the proposed construction site and any associated degradation of water quality for proximal surface waters.” This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policy HRS Chapter 205A Coastal Zone Management, Section 205A-2 Coastal Ecosystems.
4. The proposed activity shall be conducted in compliance with State of Hawaii water quality standards as specified in HAR Chapter 11-54 Water Quality Standards. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies HRS Chapter 342D Water Pollution, and HAR Chapter 11-54.
5. The conservation measures that are represented in the Final FR/EA (p. 29) to protect the Hawaiian hoary bat (*Lasiurus cinereus semotus*), the Hawaiian coot (*Fulica americana alai*), and the Hawaiian hawk (*Buteo solitarius*), which are all State of Hawaii listed endangered species, shall be fully implemented. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies HRS Chapter 205A Coastal Zone Management, Section 205A-2 Coastal Ecosystems, HRS, 183D Wildlife, HRS Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants, and HAR Chapter 13-124 Indigenous Wildlife, Endangered and Threatened Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife.
6. To mitigate potential adverse effects to aquatic biota, as represented in the Final FR/EA (p. 31), best management practices such as silt fences and temporary vegetation shall be fully implemented. This condition is necessary to ensure consistency with Hawaii CZM Program federally approved enforceable policies HRS Chapter 205A Coastal Zone Management, Section 205A-2 Coastal Ecosystems, HRS, 183D Wildlife, HRS Chapter 195D Conservation of Aquatic Life, Wildlife, and Land

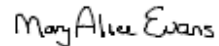
Mr. Stephen N. Cayetano
September 14, 2020
Page 3

Plants, and HAR Chapter 13-124 Indigenous Wildlife, Endangered and Threatened
Wildlife, Injurious Wildlife, Introduced Wild Birds, and Introduced Wildlife.

If the requirements for conditional concurrences specified in 15 CFR § 930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter as an objection pursuant to 15 CFR Part 930, subpart C.

This CZM conditional concurrence does not represent an endorsement of the proposed activity nor does it convey approval with any other regulations administered by any state or county agency. Thank you for your cooperation in complying with the Hawaii CZM Program. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,



Mary Alice Evans
Director

Enclosure (CWRM letter 8/24/20)

cc: County of Hawaii Department of Public Works
County of Hawaii Planning Department (by email)
Commission on Water Resource Management - Dean Uyeno (by email)

Attachment 4: CULTURAL RESOURCES APPENDIX

Attachment 5: FISH AND WILDLIFE COORDINATION ACT REPORT