STATE SPECIAL USE PERMIT APPLICATION

West O‘ahu Solar Plus Storage Project

University of Hawai‘i West O‘ahu Mauka Lands Property

‘Ewa District, O‘ahu, Hawai‘i

Tax Map Key 9-2-002:007 (por.)

AES West O‘ahu Solar, LLC

AES
we are the energy

AUGUST 2020

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Abbreviations and Acronyms

AES	AES Distributed Energy, Inc.
AC	alternating current
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawaii
ATCT	Air traffic control tower
amsl	above mean sea level
BMP	Best Management Practice
CIA	Cultural Impact Assessment
CUP	Conditional Use Permit
CZM	Coastal Zone Management
DBEDT	Hawai‘i Department of Business, Economic Development and Tourism
DC	direct current
DOFAW	State of Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife
DOT	State of Hawai‘i Department of Transportation
DPP	City and County of Honolulu Department of Planning and Permitting
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
HAR	Hawai‘i Administrative Rules
Hawaiian Electric	Hawaiian Electric Company
HCEI	Hawai‘i Clean Energy Initiative
HRS	Hawai‘i Revised Statutes
IAL	Important Agricultural Land
IRS	Interconnection Requirement Study
kV	kilovolt
LID	Low impact development
LSB	Land Study Bureau

LUO	Land Use Ordinance
MW	megawatt
MWh	megawatt-hour
NCT	Notice Criteria Tool
NEC	National Electric Code
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OEG	Obstruction Evaluation Group
PPA	Power Purchase Agreement
Project	West Oʻahu Solar Plus Storage Project
PSIP	Power Supply Improvement Plan
PUC	Public Utilities Commission
RF	radio frequency
RFP	Request for Proposal
RPS	renewable portfolio standard
SCADA	supervisory control and data acquisition
SHPD	State Historic Preservation Division
SMA	Special Management Area
SPCC	Spill Prevention Control and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
TIAR	Traffic Impact Analysis Report
TMK	tax map key
TMP	Traffic Management Plan
UH	University of Hawaiʻi
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WEOP	wildlife education and observation program

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Master Application Form

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City and County of Honolulu
DEPARTMENT OF PLANNING AND PERMITTING
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

PLANNING DIVISION MASTER APPLICATION FORM

Additional data, drawings/plans, and fee requirements are listed on a separate sheet title "Instructions for Filing". *PLEASE ASK FOR THESE INSTRUCTIONS.*

All specified materials described in the "Instructions for Filing" and required fees must accompany this form; incomplete applications will delay processing. You are encouraged to consult with Planning Division staff in completing the application. Please call appropriate phone number given in the "Instructions for Filing".

Please print legibly or type the required information.

SUBMITTED FEE: $ $15,000

PERMIT/APPROVAL REQUESTED (Check one or more as appropriate):

☐ GENERAL PLAN AMENDMENT	☒ SPECIAL USE PERMIT _x_ New ____ Modify Existing
☐ STATE LAND USE BOUNDARY AMENDMENT (<15 acres) From _____ (District) To _____ (District)	☐ ZONING DISTRICT BOUNDARY ADJUSTMENT, ADMINISTRATIVE
☐ DEVELOPMENT PLAN (DP)/SUSTAINABLE COMMUNITIES PLAN (SCP) AMENDMENT Indicate DP/SCP area _____	☐ ZONE CHANGE From _____ (District) To _____ (District) ☐ AMEND UNILATERAL AGREEMENT TO ORDINANCE NO._____

☐ PUBLIC INFRASTRUCTURE MAP REVISION (Indicate Map Symbol Request): ☐CY (Corporation Yard) ☐DSP (Desalination Plant) ☐D (Drainage Way (Open Channel) ☐TS (Transit Station) ☐FS (Fire Station) ☐GB (Government Building) ☐GC (Golf Course) ☐P (Parks) ☐PS (Police Station) ☐PKG (Parking Facility/Transit Center) ☐RES (Water Reservoir) ☐SPS (Sewage Pump Station) ☐STP (Sewage Treatment Plant) ☐SW (Solid Waste Facility) ☐RTC (Rapid Transit Corridor) ☐R (Arterial & Collector Roadway) ☐W (Potable Well)

(Project/Parcel specific information should be provided for General Plan and Development Plan amendments only if appropriate.)

TAX MAP KEY(S): 9-2-002:007
STREET ADDRESS/LOCATION OF PROPERTY: Palehua Road (near intersection of Kualakai Parkway and H-1 Freeway); Kapolei, Oahu
APPLICATION/SUBJECT AREA *(Acres/sq.ft.)*: 97 acres (see footnote in Section 2 of the Written Statement)
THE PROPOSED PROJECT IS LOCATED ☐ INSIDE ☒ OUTSIDE THE:

☐Urban Growth Boundary ☒Community Growth Boundary
☐Urban Community Boundary ☐Rural Community Boundary

OF THE Ewa Development Plan
ZONING DISTRICT(S): AG-1

DEVELOPMENT PLAN/SUSTAINABLE COMMUNITY PLAN
STATE LAND USE DISTRICT: Agriculture

RECORDED FEE OWNER:
Name (& title, if any) Jan Gouveia, VP for Administration
Organization University of Hawaii (UH)
Mailing Address 2444 Dole Street, Bachman 109H
Honolulu, Hawaii 96822
Phone Number (808) 956-6405
Signature _____

APPLICANT:
Name Rob Cooper, VP Development
Organization AES West Oahu Solar, LLC
Mailing Address 282 Century Place, Suite 2000
Louisville, CO 80027
Phone Number (720) 496-5068
Signature _____

PRESENT USE(S) OF PROPERTY/BUILDING:
Fallow agricultural land with intermittent grazing

AUTHORIZED AGENT/CONTACT PERSON:
Name Lisa Kettley, Tetra Tech
Mailing Address 737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813
Phone Number (808) 441-6651
Signature _____

PROJECT NAME (If any): West Oahu Solar Plus Storage Project

REQUEST/PROPOSAL (Briefly describe the nature of the request, proposed activity or project):
The Project involves construction and operation of a 12.5-MW solar photovoltaic and 50-MWh battery energy storage system on land owned by UH. The Project area would also be made available for compatible agricultural activities. The Project would be decommissioned at the end of its 25-year lifespan.

DPP/ELOG NO._____ DPP/POSSE NO._____

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Written Statement

This document has been prepared in support of the application for a State Special Use Permit for the proposed West Oʻahu Solar Plus Storage Project (Project). Pursuant to Hawaiʻi Revised Statutes (HRS) § 205, a Special Use Permit may be sought for uses within the State agricultural or rural districts that are "certain unusual and reasonable uses….other than those for which the district is classified."

The Project would involve construction and operation of a solar photovoltaic and battery energy storage system within an area designated by the State of Hawaiʻi Land Use Commission as agricultural district. Based on the Land Study Bureau (LSB) soil classification system, the Project area includes approximately 48 acres of Class B soils, 36 acres of Class D soils, and 13 acres of Class E soils. The Project would not involve construction of any facilities on LSB Class A soils. Pursuant to HRS § 205-2(d)(6), solar energy facilities that occupy more than ten percent of a parcel or 20 acres of land in an area with LSB Class B or C soils are an allowed use within the State agricultural district with a Special Use Permit issued by the County planning commission. Because the land area in question is greater than fifteen acres, the permit is also subject to approval by the State Land Use Commission under HRS § 205-6(d).

This document and associated attachments contain all of the content requirements identified by the City & County of Honolulu Department of Planning and Permitting (DPP) for a Special Use Permit, as listed in Table 1. As detailed herein, the Project would comply with all requirements for solar energy facilities in the State agricultural district as specified in HRS § 205-4.5(a)(21), including provisions for compatible agricultural activities and future decommissioning of the Project.

Table 1. Checklist of Special Use Permit Application Requirements

Requirements	Section of Application
Pre-Application Procedures	
A. Pre-Application Meeting	Initial meeting held with DPP on April 2, 2019
B. Presentation to Neighborhood Board	Presentation provide on August 26, 2020; see Section 5.3
C. Environmental Assessment (EA)/Environmental Impact Statement (EIS) (Special Use Permit application cannot be accepted for processing until requirements of HRS § 343 are met.)	Final EA and FONSI published by OEQC on July 8, 2020
Application Requirements	
A. DPP Master Application Form	Front matter
B. Filing Fee	Attached to application package
C. Written Statement	
C1. Land Use Commission Guidelines	Section 7
C2. Consistency with State and County Plans and Programs	Section 8
a. Coastal Zone Management (HRS § 205A)	Section 8.1
b. Hawai'i State Plan (HRS § 226)	Section 8.2
c. General Plan	Section 8.3
d. Sustainable Communities Plan	Section 8.4
C3. Compliance with LUO	Section 9
C4. Compliance with HRS § 205, Part III (Important Agricultural Lands [IAL])	Section 10
C5. Site Description	Section 2
a. Soil Types and Classifications	Section 2.4
b. Topography, abutting uses and chronological history of the use of the land including the present use of the property	Sections 2, 2.1 and 2.3
C6. Project Description	Section 3
a. Details on existing and proposed uses and activities, such as hours of operation, number of persons (clients and staff) on the site, and use and number of structures.	Sections 3.1., 3.2, 3.3 and 3.4
b. Site plan showing all structures (proposed and existing), easements and driveways, uses (proposed and existing), and setbacks.	Attachment H
c. Landscape plan showing disposition of existing landscaping and proposed landscaping.	Section 3.3.4, Attachments H and K
d. Details on existing and proposed structures, building heights, building and site alterations, including parking areas, grading, setbacks, and buffering from adjoining parcels.	Section 3.1 and Attachment H
C7. Infrastructure Requirements	Section 4
a. Wastewater System	Section 4.1
b. Water	Section 4.2
c. Drainage and Flooding	Section 4.3
d. Streets and Transportation	Section 4.4
C8. Mitigative Measures	Sections 5 and 6
C9. Photos	Attachment D
If the Special Use Permit involves a portion of a lot, a metes and bounds map and description of the Special Use Permit area should be provided.	Attachment H

1 Introduction

AES Distributed Energy, Inc. is proposing the West O'ahu Solar Plus Storage Project on the island of O'ahu, Hawai'i. The Project involves construction and operation of a solar photovoltaic and battery energy storage system on land owned by University of Hawai'i ("UH" and "university" are used interchangeably throughout this document), approximately 3 miles northeast of Kapolei on the southwest side of O'ahu. The Project area encompasses approximately 97 acres[1] within an approximately 861-acre parcel (identified as tax map key [TMK] 9-2-002:007), which is part of a larger area commonly referred to as the UH West O'ahu Mauka Lands property.[2] The Project location and general setting, TMK boundaries, and land ownership are shown in Figures 1 through 4 (contained in Attachment A), respectively.

The Project is envisioned to help the State of Hawai'i achieve its Renewable Portfolio Standard (RPS) energy goals of generating 100 percent of the state's energy from renewable sources. It would include an approximately 12.5-megawatt (MW) ground-mounted solar photovoltaic system plus 50 MW-hour (MWh) battery energy storage system, as well as ancillary support facilities. It would interconnect with the Hawaiian Electric Company (Hawaiian Electric) island-wide grid via an existing 46-kilovolt (kV) sub-transmission line that traverses the Project area. The Project area would be secured for use through an agreement with UH (see Attachment B).[3] The power generated by the Project would be sold to Hawaiian Electric under a new 25-year power purchase agreement (PPA). In addition to generating and storing solar energy, the Project area would also be made available for compatible agricultural activities.

The Project would be owned and operated by AES West O'ahu Solar, LLC (AES), a Delaware limited liability company and affiliate of AES Distributed Energy, Inc., which is a subsidiary of the AES Corporation. AES Distributed Energy, Inc. has a long history in the development and operation of solar energy facilities throughout the United States, including several solar energy facilities in Hawai'i.

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[1] Based on the preliminary design, the Project is not expected to occupy the entire 97 acres within the Project area (refer to the site plan, contained in Attachment H). As further discussed in Section 2, it is anticipated that the area to be secured for the Project through an agreement with UH will be a subset of the 97-acre Project area. Any such reduction in the area secured for Project use from UH would not substantively change the size, scope, intensity, use, location or timing of the Project itself, as described in either the Final Environmental Assessment (EA) or this application.

[2] In total, the UH West O'ahu Mauka Lands property encompasses approximately 991 acres. In addition to the parcel in which the Project would be located, it also includes the following parcels: 9-2-002:001 (80 acres), 9-2-002:005 (12 acres), and 9-2-002:003 (38 acres).

[3] Under an August 2019 option agreement with UH (as amended in May 2020), AES will enter into a Grant of System Easement under which AES will have the right to develop, construct, install, operate, maintain, repair, and replace the Project upon and/or remove the Project on a portion of the UH West O'ahu Mauka Lands property. The easement area will include an exclusive area for the Project facilities, a non-exclusive access easement along existing shared-use access roads, and a non-exclusive utility easement for Hawaiian Electric. As detailed in Attachment B, AES is required to take actions as necessary to designate the area as an easement; AES expects to seek approval from the City and County of Honolulu for the easement designation in late 2020 followed by approval from Land Court in early 2021.

1.1 Background Information

Hawai‘i is widely recognized as the most fossil fuel dependent state in the nation and is exceedingly vulnerable to fluctuations in resource availability. In an effort to reduce Hawai‘i’s dependence on imported fossil fuels and increase the amount of locally produced renewable energy, the Hawai‘i Clean Energy Initiative (HCEI) was launched in 2008 through an agreement between the State of Hawai‘i and the Department of Energy. The HCEI provides a regulatory framework to address the various systems that govern energy planning and delivery within the state (DBEDT, 2019a). As part of the HCEI, the State established an RPS, as codified in Hawai‘i Revised Statutes (HRS) § 269-92. The RPS specifies that the electric utility companies that sell electricity for consumption in Hawai‘i are required to use renewable energy for the equivalent of 30 percent of net electricity sales by 2020, 40 percent by 2030, seventy percent by 2040, and 100 percent by 2045.

In 2016, Hawaiian Electric issued an update to their Power Supply Improvement Plan (PSIP) presenting specific actions that would be implemented over a five-year planning period to accelerate achievement of Hawai‘i’s renewable energy goals. In particular, the PSIP commits Hawaiian Electric to aggressively seek grid-scale renewable resources and to achieve a consolidated RPS of 52 percent by 2021. The resource needs identified for the island of O‘ahu include approximately 352 MW of grid-scale solar energy and 64 MW of grid-scale wind energy (Hawaiian Electric, 2016). To meet these resource requirements, Hawaiian Electric established a process for solicitation and procurement of qualified renewable dispatchable generation.

Through this process, Hawaiian Electric issued its *Request for Proposals for Variable Renewable Dispatchable Generation for the Island of O‘ahu* (RFP; Docket No. 2017-0352) in February 2018.[4] The RFP established a competitive bidding process for projects to provide grid-scale renewable generation to the Hawaiian Electric system, thus contributing to the State’s RPS. Based on responses to the RFP, Hawaiian Electric selected a total of eight solar plus storage projects, each of which required subsequent approval of a PPA by the Public Utilities Commission (PUC).[5] The West O‘ahu Solar Plus Storage Project was one of the projects selected by Hawaiian Electric; the PPA for the Project was approved by the PUC in August 2019 (PUC, 2019).

The area proposed for the West O‘ahu Solar Plus Storage Project is part of the overall 991-acre UH West O‘ahu Mauka Lands property. In September 2014, the UH Board of Regents approved the UH – West O‘ahu Land Use Plan, in which approximately 273 acres of the Mauka Lands property was identified for

[4] As detailed in the RFP, Hawaiian Electric indicated that renewable dispatchable generation would be sought in stages, such that a second phase of the RFP may be issued if the generation needed to meet the PSIP requirements was not fully met in the first phase of the procurement process. Phase 2 of the Hawaiian Electric RFP was issued on August 22, 2019, with projects selected in May 2020.

[5] A total of six projects (with a total capacity of approximately 247 MW and one gigawatt hour of storage) were initially approved by the PUC, including three projects on O‘ahu, one on Maui and two on Hawai‘i Island. Two additional projects, including the West O‘ahu Solar Project and a 15 MW project on Maui were also selected by Hawaiian Electric and were subsequently added to this portfolio.

an energy farm (UH, 2015). Based on the opportunity presented by the Hawaiian Electric RFP process, UH sought potential developers for a renewable energy facility in this location and ultimately awarded AES site control with development rights for the Project area. Consistent with UH's land development strategy, the Project would be enabled through an agreement in which the university would retain ownership of the land while securing a revenue stream.

1.2 Purpose and Need

Collectively, the HCEI and the State of Hawai'i's RPS establish the need to reduce Hawai'i's dependence on imported fossil fuels and increase the amount of locally produced renewable energy. The need for development and implementation of renewable energy projects is further demonstrated by the commitments detailed in Hawaiian Electric's PSIP and the associated RFP process (Hawaiian Electric, 2016; Hawaiian Electric, 2018).

The purpose of the Project is to construct and operate facilities on the UH West O'ahu Mauka Lands property that would generate and store electricity derived from solar resources, thereby providing clean, renewable energy for the island of O'ahu. The Project would help to meet the state's need for renewable energy by providing up to 12.5 MW of solar energy and 50 MWh of battery storage, which is enough to provide electricity for approximately 4,600 homes (based on average energy use). In doing so, it would directly contribute to the state's renewable energy goals, fulfilling approximately 0.5 percent of Hawaiian Electric's RPS on average over the contract term (Hawaiian Electric, 2019a). The solar energy from the Project would replace a portion of electricity that is currently generated by burning fossil fuels, thus reducing greenhouse gas emissions and other forms of pollution that are detrimental to the environment and human health. In total, the Project is expected to offset the use of approximately 545,794 barrels of fuel and 64 tons of coal, and would decrease greenhouse gas emissions by approximately 244,394 tons over its lifetime (Hawaiian Electric, 2019a). Furthermore, based on the 25-year fixed-price PPA, the energy produced by the Project would be sold at a price that is less than the current cost of fossil fuel power and would help to hedge against long-term price volatility. Hawaiian Electric estimates the ratepayer savings (assuming a typical residential bill for 500 kilowatt-hours) would be approximately $0.22 per month in 2022 and range up to $0.91 per month over the 25-year term of the Project (Hawaiian Electric, 2019a).[6,7] The Project would also help to improve electric grid stability by enabling Hawaiian Electric to utilize stored solar energy to meet peak demand. As an additional benefit, the Project's agreement with UH would provide a valuable revenue stream for the university over the next 25 years or more.

[6] Project-related cost and ratepayer savings information is based on analyses conducted by Hawaiian Electric at the time the Project was approved (Hawaiian Electric, 2019b).

[7] As part of the estimation of impacts to customer bills, as presented in their application to the PUC, Hawaiian Electric specifically notes: "Bill impacts are highly dependent on the particular production simulation modeling assumptions used for each particular year analyzed, and will be different than estimated herein over the project term as actual conditions deviate from the assumed conditions."

1.3 HRS § 343 Environmental Review

Among other things, HRS § 343-5(a) requires an environmental assessment (EA) for an action that proposes the use of state lands. Hawai'i Administrative Rules (HAR) § 11-200.1-9(a)(2)(A) further provides that "[u]nder section 343-5(a), HRS, . . . use of state or county lands includes any use (title, lease, permit, easement, license, etc.) or entitlement to those lands." The Project will entail execution of an agreement with UH for the use of state land. As described above, based on an option agreement with UH, AES will enter into a Grant of System Easement (including an exclusive area for the Project facilities, a non-exclusive access easement along existing shared-use access roads, and a non-exclusive utility easement).

Pursuant to HAR § 11-200.1-7, DPP was determined to be the approving agency for the purposes of HRS § 343 compliance because they are the agency initially responsible for receiving and processing the request for a Special Use Permit. An EA was prepared in compliance with HRS § 343 and HAR § 11-200.1. Based on the findings of the EA and application of the significance criteria in HAR § 11-200.1-13, DPP issued a "Finding of No Significant Impact" (FONSI). The Final EA and FONSI (Attachment C) supports this application and is hereby incorporated by reference.

2 Site Description

The Project area is located within the ahupua‘a of Honouliuli in the ‘Ewa District on the island of O‘ahu. It is approximately 97 acres[8] in size and sits within the southwestern portion of the 991-acre UH West O‘ahu Mauka Lands property. The UH West O‘ahu Mauka Lands property is bordered on its southeastern edge by the H-1 Freeway, beyond which is the UH West O‘ahu campus and the communities of East Kapolei. The southern and western portions of the property are bordered by vacant land, with Makakilo Quarry and the residential community of Makakilo located just beyond. The area to the north generally comprises open space associated with the Wai‘anae Mountains. To the northeast is the former Honouliuli Internment Camp site, which the National Park Service is currently working to incorporate as a National Monument. The eastern portion of the property is bordered by Honouliuli Gulch and a variety of agricultural operations; further east is Kunia Road and the Village Park community (see Figure 1; Attachment A).

The UH West O‘ahu Mauka Lands property is accessed via Pālehua Road, which extends north then west from the intersection of Kualaka‘i Parkway and H-1 Freeway; Pālehua Road is also used for access to the Makakilo Quarry, which is owned and operated by Grace Pacific. An existing gate and 24-hour security controls entry to both the UH West O‘ahu Mauka Lands property and Makakilo Quarry. From the gated entry and security guard station, located adjacent to Pālehua Road, access to the Project area would be via a network of former plantation roads which were originally constructed and used for sugar cane haul trucks; these roads have been maintained and provide continued access for various uses throughout the UH West O‘ahu Mauka Lands property. The portion of Pālehua Road and the existing access roads that would be used to access the Project area are located entirely on land owned by UH; the agreement with UH will include a non-exclusive access easement along these roadways.

Photographs of the Project area (including street access, uses on adjoining properties, and existing structures) along with a key map are provided in Attachment D.

2.1 Historic and Current Uses

Historically, the area within and surrounding the Project area was put into cultivation in the 1920s as part of an extensive sugar cane and pineapple plantation that extended across O‘ahu’s ‘Ewa Plain. The plantation included agricultural fields, irrigation and other associated infrastructure, as well as

[8] The Project area is based upon a 97-acre area defined in the option agreement with UH (see Attachment B). Given the current preliminary design, the Project is not expected to occupy the entire 97-acre Project area (refer to the site plan, contained in Attachment H). It is anticipated that the area to be secured for the Project through the easement(s) required under the option agreement with UH will be a subset of the 97-acre Project area, subject to a possible reduction of approximately 25-35 acres; the final area secured for Project use from UH will be based on the final design and engineering plans, subject to review and input by Hawaiian Electric. This area will be defined through the easement designation process, and submitted to the City and County of Honolulu and Land Court for approval. Any such reduction in the area secured for Project use from UH would not substantively change the size, scope, intensity, use, location or timing of the Project itself, as described in either the Final EA or this application.

plantation camps and housing. Since closure of the plantation in the 1990s, the land has been fallow and is intermittently used for cattle grazing. Remnants of infrastructure associated with the former plantation remains onsite, including an abandoned mill building, pump station and components of the irrigation system, as well as a portion of the Waiahole Ditch; none of this infrastructure is currently functional. The only other structure within the property is a Board of Water Supply water tank (East Kapolei 440' Reservoir), which supplies water for the UH West O'ahu campus.

2.2 Land Use Designations

Based on the land use district boundaries established by the State Land Use Commission, the Project area is entirely within the State agricultural district (see Figure 5; Attachment A). No portion of the Project area is designated or identified as Important Agricultural Land (IAL) under HRS §§ 205-47 or 205-49. According to the zoning district boundaries established by the City and County of Honolulu, the Project area is entirely within the Restricted Agriculture (AG-1) zoning district (see Figure 6; Attachment A). It is identified as agricultural and preservation area according to the Urban Land Use Map in the 'Ewa Development Plan (DPP, 2013). The Project area is not located within the Special Management Area (SMA) or any special zoning districts regulated by the City and County of Honolulu.

2.3 Topography and Elevation

The Project area is located on the lower slopes of the southern Wai'anae Mountains. The topography ranges from relatively flat to moderately sloping (see Figure 7; Attachment A). The elevation along the southeastern boundary of the Project area is approximately 280 feet above mean sea level (amsl) and rises to approximately 675 feet amsl in the northwestern portion. Pu'u Kapuai, which rises to approximately 1,050 feet amsl, is located approximately 0.5 mile northwest of the Project area.

2.4 Soil Types and Classification

2.4.1 Soil Survey, U.S. Soil Conservation Service

According to data published by U.S. Soil Conservation Service (subsequently renamed the Natural Resources Conservation Service [NRCS]), the majority of the soils within the Project area are identified as Mahana silty clay loam (McC2, McD2, and McE2), as shown on Figure 8 (Attachment A). The land capability classification for McC2 is 3e if irrigated and 4e if non-irrigated (severe to very severe limitations on cultivated use due to erosion). For types McD2 and McE2, the land capability classification is 4e if irrigated and 6e if non-irrigated (very severe limitations on cultivated use to unsuitable for cultivation due to erosion) (NRCS, 2019; NRCS, 2020).

In addition to the Mahana series, small areas of Molokai silty clay loam (MuC, MuD) and Kawaihapai clay loam (KIB) are also present. The land capability classification for MuC is 3e if irrigated and 4e if non-irrigated (severe to very severe limitations on cultivated use due to erosion); MuD has a classification of 4e for both irrigated and non-irrigated conditions (very severe limitations on cultivated use due to

erosion). Soil type KIB has a land capability classification of 2e for both irrigated and non-irrigated conditions (moderate limitations on cultivated use due to erosion) (NRCS, 2019; NRCS, 2020).

All of the NRCS soil types mapped within the Project area are generally described as well-drained, with a medium to high potential for runoff (NRCS, 2019). Overall, the soils within the Project area have been highly modified over time as a result of extensive cultivation for the previous sugarcane plantation. Evidence of soil erosion, such as rills and small gullies, are present within portions of the Project area.

2.4.2 Agricultural Lands of Importance in the State of Hawai‘i (ALISH)

The State Department of Agriculture developed and compiled the Agricultural Lands of Importance to the State of Hawai‘i (ALISH) Classification System in 1977 in cooperation with the NRCS. The ALISH system identifies and classifies agriculturally suitable land based on a wide range of factors including soil characteristics, climate, moisture supply, and other general production-related factors. The three classification ratings are: (1) prime agricultural lands, (2) unique agricultural lands, and (3) other important lands. Unclassified lands are not considered important for agriculture. As shown in Figure 9 (Attachment A), most of the Project area is classified as other important lands, which is land other than prime or unique agricultural land that is also considered to be of statewide or local importance to agricultural use. A portion of the Project area is classified as prime agricultural land, which is considered to have the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when properly managed (NRCS, 2008).

2.4.3 Land Study Bureau

This statewide inventory was developed by the LSB of the University of Hawai‘i in the 1970s, and provides an agricultural productivity rating based on characteristics including texture, slope, salinity, erodibility, and rainfall. It classifies land into categories ranging from Class A to Class E (with Class A representing the most productive soils and Class E representing the least productive soils). As previously noted, the Project area is designated as having LSB Class B, D, and E soils (see Figure 10; Attachment A). In total, the Project area includes approximately 48 acres of Class B soils, approximately 36 acres of Class D soils, and approximately 13 acres of Class E soils. The Project would not involve construction of any facilities on LSB Class A soils.

2.5 Water Resources

The Project area is within the upper portion of the Kalo‘i Gulch watershed. Surface water features within the Project area include tributaries to Kalo‘i Gulch and a portion of the Waiahole Ditch. No perennial streams or wetlands occur within the Project area.

The Kalo‘i Gulch system consists of numerous tributaries that originate in the Wai‘anae Mountain Range and enjoin to form one channel just mauka of the H-1 Freeway (Parham et al., 2008). Tributaries to Kalo‘i Gulch run along the southern boundary and through the central portion of the Project area (Figure 11; Attachment A). Within and immediately adjacent to the Project area, these tributaries have physical

indicators of occasional surface water flow (e.g., defined bed and bank, ordinary high water mark), but the features are typically dry and only carry water during and immediately following rain events.

The portion of the Waiahole Ditch within the Project area consists of a concrete ditch, with a metal pipe (roughly 4.5 inches in diameter) immediately adjacent to the ditch. The Waiahole Ditch and associated pipeline feature are part of the Waiahole Ditch System, which was constructed in the early 1900s to transport water from the windward side of the Koʻolau Mountains to leeward Oʻahu to irrigate dry agricultural lands. Within the Project area, the ditch and pipeline no longer function to carry water.

To confirm whether the features within the Project area are subject to regulation by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, a jurisdictional delineation was conducted in May 2019 in accordance with the 2015 Clean Water Rule (USACE and EPA, 2015). The delineation report was submitted to the USACE for review and verification in July 2019. On September 4, 2019, the USACE provided written confirmation that the features within the Project area are not jurisdictional Waters of the U.S., and therefore are not subject to regulation under the Clean Water Act.

2.6 Biological Resources

A biological resources survey was conducted within the Project area on January 31, 2019 and February 5, 2019, with a follow-up survey on November 14, 2019 to confirm the findings relative to an adjustment in the Project area boundary. The purpose of the survey was to characterize the existing habitat and assess the potential for state or federally listed threatened, endangered, or otherwise rare plants or animals to occur within the Project area. As part of this effort, a survey specifically intended to detect pueo or Hawaiian short-eared owl (*Asio flammeus sandwichensis*) was conducted within the Project area. To increase detectability, three additional pueo surveys were conducted in September, November, and December 2019. These surveys followed the Pueo Project survey protocol (Price and Cotín, 2018) and were conducted during twilight hours when pueo are more likely to be detected (M. Price/ UH Mānoa, pers. comm., September 2019; Cotín et al., 2018). The survey results are summarized below, with additional detail provided in the attached survey reports (Attachment E).

2.6.1 Vegetation

In general, the survey indicates that the Project area has been extensively modified by previous agricultural use and the introduction of invasive species, which has resulted in a reduction of the number and abundance of native species and habitats suitable for native species. Vegetation within the Project area is dominated by Koa Haole Scrub. This vegetation type is characterized by open to dense stands of non-native koa haole trees (*Leucaena leucocephala*), ranging from 4 to 8 feet in height. Guinea grass (*Urochloa maxima*) is the most abundant plant in the understory, although buffelgrass (*Cenchrus ciliaris*) is also occasionally present. Kiawe trees (*Prosopis pallida*) are sparsely scattered throughout the Project area. Other common species widely occurring in the Project area include klu (*Acacia farnesiana*), ʻilima (*Sida fallax*), ʻuhaloa (*Waltheria indica*), and *Sida ciliaris*.

A total of 29 plant species were observed during the biological survey; a complete list is provided in the Biological Resources Survey Report (Attachment E). Of the species observed, only four are native to the Hawaiian Islands, including hoary abutilon (*Abutilon incanum*), ʻilima, ʻuhaloa, and wiliwili (*Erythrina sandwicensis*). In the Project area, wiliwili are limited to several trees scattered in the gulch along the southern boundary. This endemic tree is relatively rare on Oʻahu primarily due to coastal development and insect pests, but is more abundant on Maui and Hawaiʻi Island. The remaining three native plant species occur throughout the Project area; all three species are indigenous (i.e., found in the Hawaiian Islands and elsewhere) and are common across the Hawaiian Islands (Wagner et al. 1999). The native ʻaʻaliʻi (*Dodonaea viscosa*) was also observed immediately outside the Project area. No federal or state-listed threatened, endangered, proposed listed, or candidate plant species were observed in the Project area during the biological survey.

2.6.2 Wildlife

A total of 21 bird species were observed during the biological survey. All of the observed avian species are non-native to the Hawaiian Islands and are commonly found in rural or agricultural areas. Zebra dove (*Geopelia striata*) and common myna (*Acridotheres tristis*) were the most commonly observed avian species during the survey within the Project area. A complete list of the bird species observed is provided in the Biological Resources Survey Report (Attachment E).

Two non-native terrestrial mammal species were observed in the Project area – cattle (*Bos taurus*) and small Indian mongoose (*Herpestes auropunctatus*). Although not observed, other introduced mammals, such as dogs (*Canis familiaris*), cats (*Felis catus*), house mice (*Mus musculus*), and rats (*Rattus* spp.) are likely to occur in the Project area.

Large insects observed during the biological survey include yellow garden spider (*Argiope aurantia*), globe skimmer (*Pantala flavescens*), fork-tailed bush katydid (*Scudderia furcata*), praying mantis (*Mantis religiosa*), large orange sulfur (*Phoebis agarithe*), gulf fritillary (*Agraulis vanillae*), and Carolina locust (*Dissosteira carolina*). Of these species, only the globe skimmer is native to the Hawaiian Islands.

2.6.2.1 Federally and State Listed Species

No federally or state listed species were observed during the biological surveys, nor has any portion of the Project area been designated as critical habitat. Although not observed during the surveys, several federally or state listed species have the potential to occur within or traverse over the Project area, as listed below. Additional details regarding the life history and habitat requirements for these species is provided in Section 3.4 of the EA.

Hawaiian Hoary Bat (ʻŌpeʻapeʻa; *Lasiurus cinereus semotus*)

The biological survey for the Project did not include focused surveys for the Hawaiian hoary bat (e.g., acoustic bat detectors or night vision goggles). As the U.S. Fish and Wildlife Service (USFWS) and State of Hawaiʻi Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW) recognize all woody vegetation greater than 15 feet tall as potential bat roosting habitat (DOFAW, 2015; USFWS, 2019), Tetra Tech noted the presence of any such trees or shrubs within the Project area which could be

used for roosting. Although the majority of the woody vegetation within the Project Area is relatively short and scrubby (e.g., koa haole), the scattered kiawe trees throughout the Project Area and the wiliwili trees within the southern tributary to Kaloʻi Gulch may provide potentially suitable roosting habitat. Given the species' wide range of foraging habitat, it is also likely that bats forage in or near the Project Area. The nearest known detection of a Hawaiian hoary bat is from a detector deployed near the West Loch Golf Course (approximately 2.2 miles from the Project area) for a systematic survey being conducted across Oʻahu as part of an island-wide occupancy and distribution study (Starcevich et al. 2019).

Hawaiian Short-eared Owl (Pueo; *Asio flammeus sandwichensis*)

As previously noted, a survey specifically intended to detect pueo was conducted on the morning of February 5, 2019 (from civil twilight to 60 minutes after sunrise) as part of the biological survey. Pueo were not seen or heard within the Project area during this initial survey. To increase detectability, three additional pueo surveys were conducted on September 26, November 14, and December 19, 2019; these surveys followed the Pueo Project survey protocol (Price and Cotín, 2018) and were conducted during twilight hours when pueo are more likely to be detected (M. Price/ UH Mānoa, pers. comm., September 2019; Cotín et al., 2018). Pueo were not seen or heard within the Project area during these surveys. Although not detected within the Project area, this species has been reported to use the surrounding areas; the nearest known observation to the Project area is near the southern edge of the UH West Oʻahu campus (Price and Cotín, 2018; Pueo Project, 2019b). Given the habitat present, pueo could potentially forage or nest in and around the Project area. However, based on consultation with DOFAW biologists and Pueo Project researchers regarding the survey results and previous pueo detections in the vicinity, it is understood that pueo are not likely to use the Project area on a regular basis given the lack of detection during the surveys (A. Siddiqui/ DOFAW, pers. comm., October 2019).

Hawaiian Seabirds

Federally and state listed seabird species that occur in Hawaiʻi include the Hawaiian petrel (ʻua'u; *Pterodroma sandwichensis*), band-rumped storm petrel (ʻake'ake; *Oceanodroma castro*) and Newell's shearwater (ʻa'o; *Puffinis auricularis newelli*). These species spend most of their time at sea, returning to land only during the breeding season. Seabirds have not been documented in the Project area and suitable nesting habitat does not exist in or near the Project area. However, suitable nesting habitat may exist in upper elevations of the Waiʻanae Mountains, suggesting the potential for these birds to fly over the Project area at night while transiting between nest sites and the ocean.

Hawaiian Waterbirds

Listed waterbird species that occur in Hawaiʻi include Hawaiian stilt (aeʻo; *Himantopus mexicanus knudseni*), Hawaiian coot (ʻalea kea; *Fulica alai*), Hawaiian common gallinule (ʻalea ʻula; *Gallinula galeata sandvicensis*), and Hawaiian duck (koloa maoli; *Anas wyvilliana*).[9] Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found

[9] Although the Hawaiian duck is included in this discussion, genetic studies indicate that the Oʻahu population is heavily compromised by hybridization with feral mallards (*Anas platyrhynchos*) and few ducks with predominantly Hawaiian duck characteristics remain (Browne et al., 1993; Fowler et al., 2009; USFWS, 2011).

wherever ephemeral or persistent standing water may occur. No suitable habitat for listed waterbirds occurs in the Project area, and none of these species were observed during the biological survey.

2.7 Historic Properties

To identify, document and assess the significance of historic properties within the Project area, an archaeological inventory survey (AIS) was conducted by Cultural Surveys Hawai‘i. The AIS included background research (with sources including archival documents, historic maps, Land Commission Awards [LCAs], and previous archaeological reports) to construct a history of land use and to determine if historic properties have been previously recorded in or near the Project area, as well as to formulate a predictive model of the types and locations of historic properties that would be expected to occur. The field component included a 100 percent pedestrian inspection of the Project area to identify any potential historic properties within the Project area. The results of the background research and field investigation were documented in an AIS Report, which was submitted to the State of Hawai‘i Historic Preservation Division (SHPD) in compliance with HRS § 6E and HAR § 13-284 on February 5, 2020; SHPD’s review and acceptance of the AIS Report is pending. The findings of the AIS are summarized below; a copy of the AIS Report is provided in Attachment F.

The Project area is located within the ahupua‘a of Honouliuli, which stretches from the summit of the Wai‘anae Mountains to the west shore of Pearl Harbor in the east, and is separated from the Pearl Harbor entrance channel and the ocean by Pu‘uloa Ahupua‘a on its southeast side. Background research indicates little traditional land use occurred in the portion of Honouliuli Ahupua‘a in which the Project area is situated. Large settlements were primarily concentrated near the coast, near marine and estuarine resources, or in the irrigated lowlands suitable for wetland cultivation. Indigenous activities that might have occurred in the vicinity of the Project area, which is situated between the limestone plain and upland forest resources, are believed to have been limited to dryland agriculture within gulches or near springs, and mauka to makai trails and associated temporary shelters. However, any evidence of traditional land use that might have occurred in the area is likely to have been eliminated by historic agricultural and ranching activities that spanned this region through most of the mid-twentieth century. From 1913 to 1916, the Waiahole Ditch was constructed to transport water from the windward side of O‘ahu, through tunnels in the Ko‘olau Mountains, to irrigate agricultural fields for the Oahu Sugar Company in ‘Ewa. Most of the Project area and the surrounding lands were being cultivated by Oahu Sugar Company by 1925. Small residential camps associated with the plantation were the only settlements found in the upper slopes in the early twentieth century; historic maps show “Pump Camp 5” located within the Project area. Various roads and fence lines related to agricultural and/or ranching activities in the region are known to have existed in the Project area at one time. Previous archaeological studies have documented various plantation-era historic properties in the vicinity of the Project area; these include walls, alignments, mounds, ditches and other irrigation features, as well as the Waiahole Ditch (Dega et al., 1998). As part of the current AIS fieldwork, two historic properties were documented within the Project area, as follows:

- **Historic irrigation and plantation infrastructure (State Inventory of Historic Places [SIHP] # 50-80-08-5593):** This historic property was originally identified by Dega et al. (1998) as part of a 1998 AIS conducted for the UH West Oʻahu campus. SIHP # 50-80-08-5593 consists of an historic irrigation system and plantation infrastructure, including a mill building and pump station, bridges, troughs, transport ditches, pipes, culvert, sluice gate and various other features related to water retention and movement. Based on the previous documentation, the boundaries of this site extend well beyond the current Project area. As part of the current AIS, components of SIHP # 50-80-08-5593 were documented extending from outside the northwestern boundary and through the central portion of the Project area toward the southeast. Two new features of SIHP # 50-80-08-5593 were documented within the Project area: drain pipes (Feature 1) and a complex of water control features related to the pump house and mill building located just southeast of the project area (Feature 2A through 2E).[10]
- **Waiahole Ditch System (SIHP # 50-80-09-2268):** The Waiahole Ditch System was also identified as a historic property by Dega et al. (1998). SIHP # 50-80-09-2268 consists of the entire ditch system, which spans approximately 22 miles to transport water from the windward side of the Koʻolau Mountains across central Oʻahu to the ʻEwa Plain. The portion of the ditch in the vicinity of the Project area is not part of the main Waiahole Ditch that carries water from windward Oʻahu (most of which is still in use); rather it is one of several ditches that extends from a reservoir fed by the main Waiahole Ditch. While the remnant of the ditch within the Project area is undoubtably part of the Waiahole Ditch System as a whole, the portion within the Project area and its components are in remnant condition. Within the Project area, the ditch extends along the northwestern border, then crosses through the central portion and exits across the southern boundary, beyond which it continues in a southwesterly direction. Seven new features were documented within the Project area: a culvert and bridge (Feature E), two ditch portions with metal pipes and sluice gate components (Features F and G), a metal drainage flume (Feature H), a bridge components of the ditch (Features I and J), and culvert and tunnel feature with metal sluice gate (Feature K).

No indications of traditional land use were observed, nor were remnants of Pump Camp 5 identified within the Project area.

2.8 Cultural Resources

To evaluate the potential effect of the Project on cultural beliefs, practices, and resources, including traditional cultural properties, Cultural Surveys Hawaiʻi conducted a cultural impact assessment (CIA). The assessment included archival research regarding Hawaiian activities including kaʻao (legends), wahi pana (storied places),ʻōlelo noʻeau (proverbs), oli (chants), mele (songs), traditional moʻolelo (stories),

[10] Schematic drawings from previous studies (based on Dega et al. 1998, as shown in Figures 26 and 43 in the AIS Report) suggest the pump house and mill building are within Project area; however, these drawings are sketches based on approximate locations. The pump station and mill building are accurately shown in the Project figures as being located just beyond the southeastern boundary of the Project area.

traditional subsistence and gathering methods, ritual and ceremonial practices; background research focused on land transformation, development, and population changes beginning with the early post-Contact era to the present day. Cultural documents, primary and secondary cultural and historical sources, historic maps, and photographs were reviewed for information pertaining to the Project area. Community consultation was also conducted to obtain input from knowledgeable individuals regarding present and past uses, cultural sites, traditional gathering practices, cultural association and any associated cultural concerns. This effort included outreach to approximately 70 Hawaiian organizations, agencies and community members. A total of 12 people responded, with one providing written testimony and three kamaʻāina (Native-born) and/or kūpuna (elders) participating in formal interviews, as follows:

- Christian Kaimanu Yee - kamaʻāina and knowledgeable of moʻolelo and wahi pana
- Shad Kāne - member of Kapolei Hawaiian Civic Club, Chair of the Oʻahu Council of Hawaiian Civic Clubs Committee on the Preservation of Historic Sites and Cultural Properties, Aliʻi Ai Moku of the Kapuāiwa Chapter of the Royal Order of Kamehameha Ekahi, and ʻEwa Moku Representative on the State Aha Moku Advisory Committee
- Lynette Paglinawan - cultural practitioner and educator; teaches a course on Native Hawaiian Healing at UH West Oʻahu
- Tom Berg - former Councilman, District 1

Based on information gathered from the archival research and community consultation, no culturally significant resources were identified within the Project area. At present, there is no documentation or community input indicating traditional or customary Native Hawaiian rights are currently being exercised within the Project area. While no cultural resources, practices, or beliefs were identified as currently existing within the Project area, there is a rich cultural history of traditional or customary Native Hawaiian rights exercised within the Honouliuli Ahupuaʻa. A summary of the discussion contained in the CIA Report is provided below; a copy of the CIA Report is contained in Attachment G.

Honouliuli Ahupuaʻa is the largest ahupuaʻa in the moku of ʻEwa. Early historical accounts indicate that pre-Contact settlement in this ahupuaʻa was centered around the rich cultivated lands of Honouliuli ʻIli (where Honouliuli Stream empties into the ocean) which provided for extensive wetland taro cultivation and abundant coastal resources. An extensive coastal plain consisting of an exposed limestone platform also included recurrent use habitations for fishermen and gatherers, and sometimes gardeners. Dissolution pits and caves that formed in exposed limestone outcroppings were accessed for water that accumulated via a subterranean or karst system; this water also contained nutrient-rich sediment that allowed for cultivation of plants such as taro or kalo (*Calocasia esculenta*), ti or kī (*Cordyline fruticosa*), and Indian mulberry or noni (*Morinda citrifolia*) within the pits (McAllister, 1933). The upland dry forest areas were used for hunting and gathering of forest resources, but likely not for widespread permanent settlement. In the intermediate area between the limestone plain and the upland forests, in the vicinity of the Project area, indigenous Hawaiian activities would have been limited to dryland agriculture within

gulches or near springs, and mauka to makai trails and associated temporary shelters. No evidence of traditional gathering practices in the vicinity of the Project area was encountered.

In traditional times, trails were well used for travel within the ahupuaʻa between mauka and makai areas and laterally between ahupuaʻa. A historical trail system existed on Oʻahu extending from Honolulu to Waiʻanae. A cross-ahupuaʻa (east-west) trail passed through Honouliuli inland of Puʻu o Kapolei, and continued along the coast to Waiʻanae following the route of the modern Farrington Highway; this trail was approximately 0.9 mile (1.5 kilometers) southeast of the Project area. Another main trail extending up the central plain of Oʻahu was approximately 1.8 miles (3 kilometers) to the east (see Figure 6 in the CIA; Attachment G). Early historic maps also depict a trail branching off the cross-ahupuaʻa trail into the uplands in the Pālehua area. An 1825 map shows this trail passing a couple hundred meters southwest of the Project area (see Figure 7 in the CIA; Attachment G). A 1919 map shows an unimproved road alignment (labeled as Pālehua Road) south of the Project area, approximating the traditional Hawaiian footpath into the uplands on the north slope of Puʻu Makakilo, as well as a less formal trail into the uplands skirting the west side of Puʻu Kapuaʻi to the west of the Project area (see Figure 16 in the CIA; Attachment G). A subsequent map (1922) shows the road to Pālehua as arcing through the southwest portion of the Project area before traversing the north side of Puʻu Makakilo. However, the alignment indicated on the 1922 map is believed to be an approximation, as all other maps show the location further to the southwest toward Puʻu Makakilo; furthermore, no trail was identified on the ground along the alignment indicated on the 1922 map during either of the AIS studies conducted in this area (Dega et al., 1998; Welser et al., 2020). The Pālehua trail may always have been somewhat braided, but is not believed to have extended into the Project area. Access into the southeastern Waiʻanae Mountains today is facilitated by Makakilo Drive. Based on the available information, no historic trails are known to be extant within the Project area.

As previously described in Section 2.6.2, faunal resources that occur in Honouliuli Ahupuaʻa include the pueo or Hawaiian short-eared owl and the ōpeʻapeʻa or Hawaiian hoary bat; these are both endemic species and are federally and/or state listed as endangered. Culturally, the pueo is one of the most important ʻaumākua gods and ancestral deities of the family (Valeri, 1985). As part of the CIA, Mr. Tom Berg provided input that the pueo has "a direct connection to Native Hawaiian family lineage in ʻEwa Beach," noting that the pueo is the ʻaumakua for the Michael Lee family. He described the Project area as being within a "pueo (owl) foraging and breeding ecosystem," and stated that historic records indicate the pueo is most abundant on the slopes from Puʻu Kapuaʻi to West Loch. He added that "Hunehune Gulch, Kaloʻi Gulch, and Honouliuli Gulch are migratory routes used by the pueo to go from mountain to sea to court, mate, forage, and raise their brood." Mr. Berg also provided input that the Project area is inhabited by the ōpeʻapeʻa, noting that in 1910, the species was documented by the State of Hawaiʻi within a half-mile of the Project area. While ʻōpeʻapeʻa are rarely documented as ʻaumakua, they fit the intersection of classes of animals (mammal and bird) and intersection of two domains (air and land) that would make them an appropriate manifestation of the ʻaumakua (Valeri, 1985). Both pueo and ʻōpeʻapeʻa are greatly celebrated in the moʻolelo of Hawaiʻi's past.

3 Project Description

The proposed Project consists of construction and operation of an approximately 12.5 MW ground-mounted solar photovoltaic system, coupled with a 50 MWh battery energy storage system and related interconnection and ancillary facilities. Specifically, it includes the following major components: (1) solar photovoltaic system, (2) battery energy storage system, (3) a network of electrical collector lines, (4) Project substation and Hawaiian Electric interconnection equipment, (5) communication equipment, and (6) service roads and fencing. Each of these components is described in Section 3.1. In addition to these facilities, the Project area would be made available for compatible agricultural activities, as described in Section 3.2. A discussion of the proposed construction, operations and maintenance, and decommissioning activities is provided in Section 3.3.

The site layout and details of the Project components are provided in Attachment H.[11] As indicated in the site layout, all of the Project components as well as Project-related construction activities would occur within the limits of the 97-acre Project area. Representative photographs that show examples of the components at similar projects are provided in Attachment I.

3.1 Project Components

3.1.1 Solar Photovoltaic System

The solar photovoltaic system would consist of a series of 405-watt (minimum) modules mounted on a fixed-tilt racking system and related electrical equipment. The Project would include four solar array areas, within which the modules would be organized in rows (or "strings"); the row-to-row spacing would be approximately 22 feet (with approximately 8 feet of open space between adjacent rows). The racking system would hold the modules at a fixed angle of 15 degrees facing toward the south. The racking system would include steel posts installed to a depth of approximately 6 feet (depending on soil conditions). Once on the racking system, the highest point of the modules is expected to extend approximately 8.5 feet above the ground, with an average of 3 feet of clearance below the modules.

The modules would produce direct current (DC) electricity at a maximum voltage of 1500 volts. Within each solar array area, the DC electricity from the modules would be transmitted via DC electrical wiring to a 2.8 MW central inverter, where it would be converted to alternating current (AC) electricity. The inverter would connect to a step-up transformer, which would increase the electrical voltage to 12.5 kV.

[11] The site layout and details shown in Attachment H are based on an approximately 60 percent design milestone. The exact layout and configuration of these components will be refined through the final design process; in particular, refinements are anticipated based on Hawaiian Electric's technical review and the equipment procurement process. Any such refinements would be expected to be relatively minor such that they would not substantively change the size, scope, intensity, use, location or timing of the Project, and the resulting footprint and dimensions would not exceed those shown in the site layout and details contained in Attachment G. The final site layout and design details will be submitted to DPP for review and approval as part of the application for grading, grubbing and stockpiling and building permits.

Safety features incorporated into the solar photovoltaic system include mechanisms to allow for disconnection and rapid shutdown of the system, if needed; these would be installed throughout the solar arrays, and would include DC disconnects (which would allow the DC current between the modules to be interrupted before reaching the inverters) and AC disconnects (which would separate the inverters from the electrical grid).

The DC electrical wiring extending from the modules would be integrated into the above-ground portion of the racking system. At the terminus of each array disconnect, the wiring would connect to the inverter and transformer via underground trenching. The trenches would be up to approximately 10 feet wide and 4 feet deep to accommodate multiple circuits of DC electrical wiring, low-voltage AC electrical wiring and communications wiring. The inverter and transformer for each of the solar array areas would be installed on a concrete equipment pad (also referred to as a power conversion station). A total of five equipment pads would be installed within the Project area; each would be up to approximately 3,480 square feet and would also support the battery units and communication equipment (see below).

3.1.2 Battery Energy Storage System

The battery energy storage system would include a total of ten 1,300-kilowatt (approximate) lithium-ion battery units, collectively providing approximately 50 MWh of total storage. The batteries would be charged with energy generated by the solar photovoltaic system and would allow the energy to be dispatched to offset night-time customer demand and assist in grid stabilization. Each battery unit would be housed in a container up to approximately 10 feet (height) by 8 feet (width) by 53 feet (length); a total of 2 battery units would be installed at each of the five power conversion stations. Based on the preliminary battery configuration, each battery unit would include up to 44 racks of batteries (approximate) and would incorporate multiple layers of protection to avoid failures and to contain potential hazardous substances. Specific features would include integrated monitoring and circuit protection, a self-contained heating ventilation air cooling system, and a fire detection and suppression system specifically designed for lithium-ion battery energy storage systems. The fire detection and suppression system would incorporate specific controls with automatic safety responses in response to conditions including high battery temperature, high air temperature and the presence of smoke. The system would also have emergency stop buttons, which would isolate the battery units from the solar arrays and electrical grid.

3.1.3 Electrical Collector Lines

The electricity generated and stored within each of the solar array areas would be transmitted from the power conversion stations to the Project substation and interconnection equipment via a network of medium-voltage electrical collector lines. Similar to the DC electrical wiring from the solar modules, the medium-voltage electrical collector lines would be installed in underground trenching. Trenches for the electrical collector lines would be approximately 5 feet wide and 4 feet deep. In total, it is anticipated that the Project would include approximately 3,000 linear feet of trenching for the medium-voltage electrical collector lines.

3.1.4 Substation and Interconnection Equipment

The Project would include a substation, which would further increase the voltage of electricity to allow for integration into the Hawaiian Electric electrical grid. The Project substation and associated interconnection facilities would include equipment such as free-standing steel switch structures, a transformer, breakers, utility poles, associated electrical lines, and centralized controls structure(s) for communication equipment (see below). These facilities would be constructed immediately adjacent to the existing Hawaiian Electric ʻEwa Nui #42 46-kV sub-transmission line which traverses the Project area; they would occupy up to approximately 9,464 square feet and would include concrete foundations, pole structures, containerized structure(s) and security fencing. A short overhead electrical line, which is expected to be approximately 300 feet in length and include approximately three 60-foot-tall wood poles, would also be required for interconnection with the ʻEwa Nui #42 46-kV sub-transmission line.[12]

3.1.5 Communication Equipment

Communication equipment would be installed to interface with Hawaiian Electric's supervisory control and data acquisition (SCADA) system so that the electricity generated and stored by the Project can be remotely controlled and dispatched.[13] The Project would also include an emergency management system that would allow all operations to be supervised and all system functions to be protected in response to real-time dispatch signals from Hawaiian Electric, as well as report production data, energy forecasts, and other system health data. This equipment would be housed within the various inverters located in each solar array area and in the Project substation, as well as within centralized control structure(s) also within the substation footprint. Most of the communications equipment would be connected via cabling, although some wireless features for inter-Project communications are being evaluated.

3.1.6 Service Roads and Fencing

As described in Section 2, the Project area would be accessed via the existing gated entry on Pālehua Road and the network of former plantation roads within the UH West Oʻahu Mauka Lands property. Within the Project area, a series of new service roads would be installed to accommodate construction vehicles and to allow ongoing access for operations and maintenance. These roads would have a compacted gravel bed with a width of approximately 10 feet (plus compacted 5-foot shoulders), as well as the required clearance and turning radius needed for emergency response vehicles in accordance

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[12] The interconnection facilities would be owned and operated by Hawaiian Electric, and as such, are subject to Hawaiian Electric's design and engineering specifications. The design and engineering process, which will include technical review and input by Hawaiian Electric commenced in August 2020, following completion of an Interconnection Requirement Study (IRS). As such, the design details for the interconnection facilities are not yet fully known but are expected to be commensurate with the description provided herein. The final design details will be included in the final design package to be submitted to DPP for review and approval as part of the application for grading, grubbing and stockpiling and building permits.

[13] The specific telecommunications requirements to facilitate interaction between the Project and Hawaiian Electric are currently being reviewed by Hawaiian Telecom and Hawaiian Electric.

with fire code. The service roads would provide primary access to each of the solar array areas, including the power conversion stations, as well as the Project substation and interconnection equipment. The ample spacing between the rows of modules would allow for localized access within each of the solar array areas.

Fencing would be installed around the perimeter of the Project for general security purposes. The fence is expected to be approximately 7-foot-tall chain link (or similar); no barbed wire would be installed. Gates would be installed for pedestrian and vehicular access. The total fenced portion of the Project area is expected to be approximately 52 acres.

3.2 Compatible Agricultural Activities

HRS § 205-4.5(a)(21)(A) requires that for solar energy facilities on LSB Class B or C land in the agricultural district, "the area occupied by the solar energy facilities is also made available for compatible agricultural activities[14] at a lease rate that is at least fifty percent below the fair market rent for comparable properties." Following is an evaluation of potential agricultural activities and a discussion of the proposed approach for compatible agriculture within the Project area. This approach has been developed to meet and exceed the requirements of HRS § 205-4.5(a)(21)(A); further discussion of compliance with HRS § 205 is provided in Section 7.

3.2.1 Evaluation of Potential Agricultural Activities

Solar facilities provide a unique opportunity for co-location with agricultural activities, given that they typically have a minimal footprint with tracts of open space interspersed between the equipment, and involve relatively passive operation and maintenance activities. However, there are various factors that must be considered when seeking agricultural activities to be co-located with solar facilities. Specific factors that were considered for this Project include: (1) historic and current agricultural use, (2) water availability, and (3) suitable agricultural activities. A brief discussion of each of these considerations is provided below.

3.2.1.1 Historic and Current Agricultural Use

As previously described, the Project area was part of an extensive sugar cane and pineapple plantation that extended across O'ahu's 'Ewa Plain. Cultivation occurred on a nearly continual basis from the 1920s until the plantation was closed in the 1990s. Since that time, the land within the Project area has been fallow and used intermittently for cattle grazing. Although remnant agricultural infrastructure is present onsite, none of it is believed to still be operable.

Most of the other nearly 900 acres of the UH West O'ahu Mauka Lands property also comprise fallow, vacant land with some livestock pasturage, and remain available for agricultural activities. Scattered

[14] Within the context of HRS § 205-4.5, agricultural activities are understood to include: (1) cultivation of crops, including crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber; (2) game and fish propagation; and (3) raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use.

agricultural operations occur in the broader vicinity of the Project area; however, there are relatively extensive amounts of vacant agricultural lands throughout the region.

3.2.1.2 Water Availability

Given the highly arid conditions in the ʻEwa District, past agricultural activities within this region relied on imported water for irrigation. In particular, this area was served by the Waiahole Ditch, an approximately 26-mile-long tunnel and ditch system built in the early 1900s to deliver water from the windward side to the leeward side of Oʻahu. On average, the ditch delivered approximately 27 million gallons of water per day (Environment Hawaiʻi, 2000). In the 1990s, a legal challenge resulted in restoration of water flows to the streams in windward Oʻahu and a significant decrease in the amount of water delivered via the Waiahole Ditch.

Although remnant portions of the Waiahole Ditch remain within the Project area, this infrastructure no longer functions to deliver water; no functional irrigation infrastructure or water delivery system currently exists within the Project area. As part of the planning process for the Project, a request for guidance and input regarding potential water sources was submitted to the Board of Water Supply. Their response included a request for more information regarding the anticipated demands and indicated the need to first investigate the use of non-potable water for irrigation purposes. Installation of a private water source such as a groundwater well or reservoir was determined to be prohibitive given the Project schedule mandated by the PUC, the temporary nature of the Project (per the 25-year PPA) and that compatible agricultural activities such as grazing and honey could be accommodated within the Project area without such source. While trucking and storing non-potable water on site could be possible for modest water demands (such as for establishment of landscaping), it would not be feasible to meet the significant demand of crop cultivation. Subsequent communication with the Board of Water Supply confirmed that water service for irrigation purposes could not be provided by the Board of Water Supply as their water system has limited capacity and cannot accommodate the proposed agricultural demands. However, they indicated that it may be possible to use the existing water tank (East Kapolei 440' Reservoir) as a source of irrigation water, but that this would need to be coordinated through UH. Based on coordination with UH about the availability of this water, it was determined that a modest amount of water could be made available to support compatible agricultural uses, but that there is not sufficient availability to support uses with significant water needs (e.g., crop cultivation). AES is continuing to coordinate with the Board of Water Supply and UH to confirm the use of water from the existing East Kapolei 440' Reservoir for compatible agricultural uses within the Project area. Relevant correspondence with the Board of Water Supply and UH regarding water availability is contained in Attachment J.

3.2.1.3 Suitable Agricultural Activities

Solar facilities are considered to be highly compatible with agricultural activities, and there are a growing number of examples of successful dual use and the associated benefits to both solar and agricultural production (PRI, 2018; Scientific American, 2018). However, there are factors that contribute to certain types of agricultural activities being more or less suitable for co-location with solar

facilities. When considering crop production, low-growing species are preferred as they can be located within the same space as the solar photovoltaic modules with little to no risk of reducing solar exposure, as compared to taller stature plants which can cast shadows across the modules as they grow in height. Given the proximity to the solar photovoltaic modules, it is also important that selected species are semi shade-tolerant. Any such low-growing and shade-tolerant species must also be well-suited for the site-specific conditions, which in this case includes relatively arid conditions and disturbed soils with a medium to high runoff potential.

Other agriculture activities, such as raising livestock, are also highly viable and provide dual use benefits. For example, use of the solar array areas for grazing animals not only provides affordable pasturage for grazing, but also provides a form of natural vegetation management around the solar equipment. However, the size and characteristics of the livestock must be carefully considered. Grazing is typically limited to smaller animals (such as sheep and calves) as they easily fit between and beneath the solar photovoltaic modules and present little risk of damage to the equipment; goats are typically avoided as they tend to climb on the equipment. Beekeeping is also highly compatible with solar equipment and is successfully being conducted as part commercial solar projects across the United States (CleanTechnica, 2019; PRI, 2018; Scientific American, 2018).

3.2.2 Proposed Agricultural Activities

As part of the Project development process, AES engaged the services of former Hawai'i Department of Agriculture Chairperson and Deputy Director Scott Enright, and has proactively sought partners to develop a compatible agricultural plan for the Project. Along with the input and counsel of Mr. Enright, AES contacted and worked with a wide range of potential partners to explore opportunities that go beyond the statutory requirements to simply provide land for complementary agricultural uses, and instead seek to provide meaningful contributions and generate agricultural products. Potential partners were identified based on knowledge of active agricultural organizations as well as input received through community outreach; these include the UHWO agricultural program, Ma'o Farms, Mālama Learning Center, Hui Kū Maoli Ola, various cattle and sheep ranchers (Rocker G Livestock and others) and beekeepers (Aloha Bee, LLC). Various options for agricultural activities that could be conducted in parallel with the solar energy facilities within the Project area were examined, based on the considerations described above. The results of this effort indicate that the most promising agricultural activities that could be implemented as part of the Project are honey production and/or cattle grazing and production. As further detailed below, these activities are both compatible with solar energy facilities, well-suited to the site-specific conditions, and require minimal water resources.

3.2.2.1 Honey Production

Honeybees are a critical component of the agricultural system as they serve to pollinate a wide variety of crops. It is estimated that honeybees pollinate about one-sixth of the world's flowering plant species and more than 400 agricultural crops (American Beekeeping Federation, 2019; New Agriculturist, 2019). Examples of bee-pollinated plants in Hawai'i include fruit trees such as lychee, avocados, oranges and macadamia nut, and vegetables such as cucumbers, squash and watermelon. Through pollination,

honeybees may significantly increase crop yields and contribute to higher quality fruit. It is estimated that honeybees contribute nearly $20 billion to the value of U.S. crop production (American Beekeeping Federation, 2019). In recent years, Hawai'i's honeybee population has been negatively affected by introduction and spread of the parasitic Varroa mite. Feral honeybee colonies have been particularly impacted, resulting in a declining number of colonies and loss of a major source of pollinators. Such impacts to feral colonies underscore the importance of managed hives for agricultural production in Hawai'i (CTAHR, 2009).

Beekeeping is considered to be highly compatible with solar facilities, as it is a relatively passive activity and requires minimal infrastructure. Furthermore, the general setting of the Project area, including the topography and surrounding vegetation make this location particularly suitable for beekeeping. Honeybees forage up to several miles in any direction; flowering plants within and surrounding the Project area, which include koa haole (*Leucaena leucocephala)*, sweet acacia (*Vachellia farnesiana*), 'ilima (*Sida fallax*) and long-thorned kiawe (*Prosopis juliflora*), offer abundant pollen and nectar for bees. Honeybees are well-adapted to the range of temperatures that occur in the vicinity of the Project area, as demonstrated by other successful hives in the 'Ewa and Nānākuli districts. To maintain temperatures with a hive, honeybees utilize both ventilation (by fanning their wings) and evaporative cooling mechanisms (with water collected and spread by worker bees) (Tautz, 2008; Winston, 1987). There is expected to be adequate access to natural sources of water for bees throughout this region, such that a dedicated water source would not be needed within the Project area. However, if needed, a 15-gallon tub of water (with floating aquatic plants, such as *Pistia* and *Lemna*, and guppies) could be provided as a safe, nearby source.

Aloha Bee LLC is an established beekeeping operation that manages more than 30 healthy honeybee colonies across O'ahu and produces a variety of bee-related products. The partners in Aloha Bee LLC include renowned entomologist Dr. Steve Montgomery and Daniel Mills, an experienced beekeeper and honey producer. They are seeking to expand their operation and need additional land that is well-suited for placement of beehives. In coordination with Aloha Bee LLC, AES has incorporated specific beekeeping requirements into the site plan for the Project.

It is anticipated that a beekeeping operation within the Project area would involve installation of approximately four beekeeping stations to support honeybee activity throughout the Project and surrounding areas. The stations would be located within the fenced perimeter of the solar array areas and would be accessible via the proposed service roads; they would also be sited at a reasonable distance from the Project facilities to minimize interference between the solar and beekeeping operations. Each station would include a packed gravel or cement pad foundation, approximately 40 square feet in area. The foundations would provide a stable surface to minimize the chances of the hives falling over, and would help to limit weeds and bugs in the vicinity of the hives. The hives would be installed on a series of cinder block stands placed directly on the foundation. In addition, the hives would be cordoned off to minimize potential damage from cattle (another proposed compatible agricultural use within the Project area, as described below). It is anticipated that the Project area could support a total of 20-60 hives. To launch the honey production operation, Aloha Bee LLC would establish

existing hives in the Project area; the partners in Aloha Bee LLC also have access to additional hives and relationships within the beekeeping community to ensure a productive operation.

Activities associated with maintenance of the beehives would be minimal, generally consisting of periodic inspections, replacement of hive equipment and/or bees, and honey harvesting. It is anticipated that beekeepers would conduct inspections on a routine basis (approximately once per month); inspections would be focused on checking the health and productivity of the individual hives and determining if any remedial actions are needed. Remedial actions could include treatment for invasive pests, replacement or care of queen bees, maintenance or expansion of hive boxes, or similar activities. In general, it is anticipated that the beekeeping stations would be accessed during daytime hours; however, some visits could occur during evening hours to accommodate transport of bees.

Through their operation within the Project area, Aloha Bee LLC expects to produce up to 500 gallons of honey annually; these products would be marketed for sale locally on O‘ahu. In addition to agricultural products, the beehives would also provide an important ecological service through pollination of commercial crops, home garden vegetables and fruits, as well as wild plants.

3.2.2.2 Cattle Production and Grazing

The UH West O‘ahu Mauka Lands property has been used for cattle ranching as part of a rotational pasture system. These activities have been managed by Henry Edward “Bud” Gibson and his firm Rocker G Livestock, a grass farming and livestock ranching operation. In total, Rocker G Livestock stewards and manages approximately 3,200 acres of pastureland across O‘ahu, including the UH West O‘ahu Mauka Lands property. They care for three herds of cattle; two of the herds are beef cows (each with an average of 325 head) and one herd includes approximately 25 registered American Bucking Bull, Inc. cows which are raised as registered bucking and breeding bulls. These herds are rotated across the pasturelands, depending on rainfall and forage volume for fire prevention and erosion control purposes.

Rocker G Livestock is seeking to maintain their current operation within the Project area.[15] Based on consultation with owner Bud Gibson, cattle grazing facilities have been incorporated into the site plan for the Project. To maximize compatibility with the solar facilities, the Project area would be used specifically to graze and wean stocker-size (smaller) steer and heifers. Limiting the cattle within the Project area to smaller and younger animals would minimize potential damage to solar modules while still benefiting the overall ranching operation. These cattle would be managed in the same manner as Rocker G Livestock’s current ranching operation. The animals would be rotated through fenced portions of the Project area with rotation management based on rainfall levels and forage growth and volume. In addition to supporting ongoing agricultural operations, grazing cattle within the Project area would also provide a sustainable form of vegetation management.

To support the proposed cattle production and grazing operation, AES would work with Rocker G Livestock to install support facilities and equipment within the Project area. One or two cattle trap

[15] Rocker G Livestock is currently in discussions with UH regarding the extent to which their cattle ranching operations would be allowed to continue within the UH West O‘ahu Mauka Lands property. Regardless of the outcome of these discussions, AES would seek to make the Project area available to Rocker G Livestock for cattle grazing, subject to approval by UH.

areas, each up to approximately 72 feet by 72 feet, would be installed. Each trap area would be equipped with a water trough set on a concrete slab, including an approximately 4-foot apron to minimize erosion caused by cattle traffic around the trough. Mineral tubs and external parasite control rubs would also be placed in the trap areas. A system for loading and unloading cattle would be constructed using a series of galvanized steel panels and gates.

Rocker G Livestock produces an average of more than 175,000 pounds of beef annually that is sold locally throughout the state. In addition to contributing an important source of local food production for Hawai‘i, their operation also provides valuable land stewardship services including increased soil carbon storage, vegetation management, and fire prevention. Use of the Project area would help to further support these efforts.

3.2.3 Other Agricultural Alternatives Considered

Other alternatives for compatible agricultural activities were also explored; however, due to a number of factors, these options were deemed to be unviable. These include the following:

- Sheep Production and Grazing: AES actively engaged a sheep farmer from Wai‘anae to explore possible sheep production and grazing within the Project area. Unfortunately, due to the limited vegetation within the Project area along with relatively low rainfall, it was determined that sheep’s aggressive feeding habits would pose a significant risk of denuding the Project area, thus resulting in possible erosion and runoff issues. Additionally, given the limited rainfall, it was determined that vegetation could not be effectively maintained to ensure a sufficient food supply for the sheep without a rotational grazing effort that would be economically prohibitive. For these reasons, this agricultural activity was not pursued further.
- Food Crop Production: AES explored options for food crop production with various O‘ahu-based organizations, including the UHWO agricultural program, Ma‘o Farms, Mālama Learning Center. Given the limited rainfall and insufficient water supply for irrigation, as well as the relatively steep and rocky terrain, this option was not pursued further.
- Landscape Plant Propagation: AES also examined the option of native plant propagation for landscaping purposes, including possible re-landscaping needs at Makakilo Quarry, adjacent to the Project area. Although Grace Pacific, owner of the Makakilo Quarry, expressed an interest in purchasing the supply of plants, this option was not further pursued due to the limited rainfall, insufficient water supply for irrigation, and relatively steep and rocky terrain.

3.2.4 Future Agricultural Activity

As detailed above, AES will comply with HRS § 205-4.5(a)(21)(A) by making the Project area available for honey production and cattle grazing, as well as providing support for the long-term success of these activities. In the event that the agricultural activities outlined above are determined to not be viable or an agriculture partner ceases operations or an interest in partnering, AES would seek other potential

partners for similar agricultural activities and would continue to make the Project area available at a lease rate that is at least fifty percent below fair market rent for comparable properties.

At the end of the Project's operational life, the Project would be decommissioned with the Project area returned to its existing condition (or comparable), as further discussed in Section 3.5. Following decommissioning and upon expiration of the agreement with AES, a full range of future agricultural activities would continue to be an option for UH as the landowner.

3.3 Construction Activities

Project-related construction activities are expected to include transport and delivery of Project equipment and materials, site preparation, equipment installation, and revegetation and landscaping. Each of these activities is generally described below.

3.3.1 Transport and Delivery

The Project equipment would be transported to one of O'ahu's commercial harbors via a freight shipping company and offloaded to standard transportation trucks. The trucks would deliver the equipment to the Project area via existing state and county roadways. No roadway improvements or other construction is expected to be required to accommodate the equipment transport.

3.3.2 Site Preparation and BMP Implementation

Initial site preparation would involve grubbing and vegetation clearing within the Project area, along with installation of best management practices (BMPs) as described below. Clearing and grubbing would be phased, and soil would be temporarily stabilized as appropriate. Service roads and staging areas would also be established; these would be located entirely within the Project area. It is anticipated that the staging areas would rotate throughout the Project area as the Project is built out, with these areas installed incrementally as needed; in total, it is anticipated that staging would require approximately 12 acres (non-contiguous). For each staging area, some grading may be needed to level the ground surface, with geotextile materials and compacted gravel installed as needed. Similarly, installation of new service roads would also involve grading, smoothing and placement of geotextile material and compacted gravel. Clearing, grubbing, and grading would be conducted using equipment such as bulldozers, excavators, compactors, graders, and front-end loaders. Water trucks would be used to provide moisture for compaction as well as dust control during construction as needed.

Project implementation would incorporate BMPs to avoid and minimize potential impacts to the surrounding environment. In particular, BMPs would include various procedures, practices, treatments, structures and/or devices designed to eliminate and minimize the potential discharge of pollutants to downstream waters. The BMPs to be implemented would be determined in accordance with applicable regulatory requirements, including those associated with the National Pollution Discharge Elimination System (NPDES) program and the City and County of Honolulu's Rules Relating to Water Quality (Administrative Rules § 20-3), which require approval of a Stormwater Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control Plan (ESCP) prior to construction. As further discussed in

Section 6.1, specific BMPs would address erosion prevention, sediment control, and good housekeeping. No ground disturbing activities would occur until BMPs have been properly implemented.

In addition, the Project would also incorporate a series of infiltration trenches to capture and treat stormwater in areas with increased impervious surfaces associated with the Project facilities. Throughout the majority of the Project area, including the area beneath the solar modules, minimal grading would be required such that the existing drainage patterns would not be altered. In general, grading would be focused around the service roads, equipment pads and substation foundation. The infiltration trenches would be located within the Project area, downgradient of these facilities and would be designed to retain and allow for infiltration or evapotranspiration of stormwater, as needed to reduce peak flows to pre-development levels. The size and design of the trenches would be based on site-specific conditions as well as the requirements of the City and County of Honolulu's Rules Relating to Water Quality and Storm Drainage Standards (DPP, 2017a).

3.3.3 Equipment Installation

Following site preparation activities, the general sequence for construction would involve installation of the following: (1) racking system, (2) concrete equipment pads and substation foundation, (3) solar photovoltaic modules and associated wiring, (4) electrical collector lines, (5) electrical equipment, and (6) battery units. Overall, these facilities are being designed to specifically accommodate the existing topography of the site in order to minimize the amount of earthwork needed. As further detailed below, grading for installation of the Project equipment is expected to be limited to the areas comprising the equipment pads and substation foundation, as well as in localized areas within the solar arrays.

Overall, the extent of ground disturbance associated with the solar photovoltaic system is expected to be relatively minimal, as the racking system would be installed using structural posts and can tolerate the existing slopes within the Project area (based on the manufacturers' specifications); grading would be limited to localized areas as needed to smooth existing topography. The posts for the racking system would be installed using a hydraulic pile driver and/or augur for pre-drilling, with approximate depths of 6 feet (depending on soil conditions). In the event it is determined that the desired depth cannot be achieved, foundations would be pre-drilled and supported with concrete.[16] The frames and other components of the racking system would be bolted to the posts, with the solar photovoltaic modules affixed to the frames.

Trenches would be excavated for both the DC electrical wiring, as well as some AC low-voltage wiring and communications wiring (running from the solar photovoltaic modules to the power conversion stations) and the medium-voltage collector lines (running from the power conversion stations to the substation) using wheel- or track-mounted excavators (or similar). The trenches for the DC and low-voltage electrical wiring would be up to 10 feet wide and 4 feet deep to accommodate multiple circuits

[16] Ground screws, which are installed by auguring directly into the ground, are being considered as an alternative to the support posts for the racking system. Although a greater number of screws would be required, they would have a smaller overall footprint than the support posts.

of wiring. The trenches for the medium-voltage collector lines would be up to 5 feet wide and 4 feet deep. Following placement of the electrical lines, the excavated soil would be backfilled into the trench and tamped back to the appropriate level of compaction per the design specifications. Although not anticipated, if the desired trench depth cannot be achieved (due to basalt rock or other prohibitive subsurface conditions), the electrical wiring or collector lines would be covered with concrete slurry in accordance with the applicable electrical code requirements.

The equipment pads and substation foundation would involve excavation up to approximately 3 feet in depth and installation of concrete. Certain interconnection facilities would be supported by steel pier foundations, which would be installed to an approximate depth of 10 – 15 feet. Excavated soil would either be used elsewhere within the Project area or hauled to an approved offsite facility. Concrete for the pads and foundation would be delivered in ready-mix concrete trucks; the Project would not include a concrete batch plant. Once the equipment pads and substation foundation have been installed, the battery units and various electrical equipment would be installed. All electrical equipment and wiring would be installed and inspected in accordance with applicable code requirements and best industry practices.

Once fully installed, the Project equipment is expected to have a total areal extent of approximately 38.8 acres and a permanent footprint of approximately 2.2 acres, as summarized in Table 2. It is important to note that these dimensions are estimates based on the current level of design for the Project. The exact dimensions for these components will be refined through the final design process; in particular, refinements are anticipated based on Hawaiian Electric's technical review and the equipment procurement process. Any refinements are expected to be relatively minor, with the resulting dimensions similar to (or less than) that listed in Table 2.

Table 2. Approximate Extent of Project Components

Project Component	Quantity and Dimensions (approximate)	Total Area (approximate)	Permanent Footprint (approximate)
Solar Photovoltaic Modules[1]	43,008 modules (each approx. 22 ft^2) (2,304 posts for racking system)[2]	939,264 ft^2 (21.6 acres)	3,197 ft^2 (0.1 acres)
Power Conversion Stations (Battery Units and Electrical Equipment)	5 equipment pads (each approximately 3,480 ft^2)	17,400 ft^2 (0.4 acres)	17,400 ft^2 (0.4 acres)
Substation and Interconnection Equipment[3]	Substation foundation and interconnection equipment (9,464 ft^2)	9,464 ft^2 (0.2 acres)	9,464 ft^2 (0.2 acres)
Trenching (DC and Low-Voltage Electrical Wiring)	11,000 linear feet (10 feet wide)	110,000 ft^2 (2.5 acres)	0
Trenching (Medium-Voltage Collector Lines)	3,000 linear feet (5 feet wide)	15,000 ft^2 (0.3 acres)	0
Service Roads[4]	3,235 linear feet (20 feet wide)	64,710 ft^2 (1.5 acres)	64,710 ft^2 (1.5 acres)

Staging and Laydown Areas	To be rotated throughout Project area; up to 12 acres (non-contiguous)	522,720 ft^2 (12.0 acres)	0
Agricultural Facilities[5]	4 beekeeping stations (40 ft^2 each) 2 cattle trap areas (5,184 ft^2 each)	10,528 ft^2 (0.2 acre)	360 ft^2 (0.01 acre)
TOTAL		**38.8 acres**	**2.2 acres**

[1] The calculation of total area is based on the surface area of the modules. The calculation of permanent footprint is based on the dimensions of the post foundations; it is assumed that 60% of the posts would require a concrete pier with a diameter of approximately 20 inches.

[2] Ground screws, which are installed by auguring directly into the ground, are being considered as an alternative to the posts for the racking system. Although a greater number of screws would be required (approximately 7,100 screws), they would have a smaller diameter than the posts such that the permanent footprint of the screws would be less than that shown for the support posts.

[3] The exact requirements for the interconnection equipment are still being determined by Hawaiian Electric. It is currently assumed that an approximately 300-foot overhead electrical line with 3 supporting wooden poles would be required in addition to equipment within the footprint of the substation.

[4] The calculation of new service roads does not include existing access roads; new service roads are assumed to have a width of approximately 20 feet (i.e., 10-foot road width plus 5-foot compacted shoulders).

[5] The permanent footprint of the agricultural facilities is assumed to include four beekeeping stations and concrete pads for the water troughs (one in each cattle trap area).

3.3.4 Revegetation and Landscaping

Following construction, areas that have been temporarily disturbed would be revegetated for soil stabilization and erosion control purposes. It is anticipated that revegetation would involve application of hydroseeding, with a suitable mix of native and/or non-invasive grass species. Any species used for revegetation would also be considered in terms of compatibility with onsite agricultural activities (e.g., forage for grazing stock and/or pollinator plants for honeybees).

Landscaping would also be installed to provide visual buffering of Project equipment from surrounding areas to the extent practicable. In particular, this effort would address the requirements of the City and County of Honolulu's Land Use Ordinance (Revised Ordinances of Honolulu Section 21-5.650(a)(1)) which emphasizes visual buffering from adjacent streets and highways, as further described in Section 9.1.3. Development of the proposed landscape plan involved a comprehensive review of site-specific characteristics, such as those related to climate, geography, cultural and biological resources, to determine a landscaping approach that is sensitive and appropriate to this particular location. Within this context, the areas around the perimeter of the Project were explored to identify the most effective and practical locations for installation of landscaping. This effort considered the orientation and topography of the Project and surrounding areas, as well as plant installation and irrigation requirements, safety, cost and maintenance needs, all relative to the potential degree of visual buffering that would be provided relative to nearby public vantage points. In addition to these factors, specific constraints and limitations that were also considered include (1) a request from the landowner to not plant large trees due to long-term maintenance and liability concerns, (2) the lack of available infrastructure for irrigation purposes, (3) limited vehicular access, and (4) the need to minimize potential shading of the solar arrays. A detailed discussion of these factors and limitations is provided in the landscape plan narrative, contained in Attachment K.

Several options were evaluated as part of development of the landscape plan, particularly installation of plant material along the western-southwestern boundary of the Project area, facing the nearby Makakilo neighborhood. Given the Project's orientation and elevation relative to the Makakilo neighborhood, it was determined that landscape screening in this location would require plants with mature heights of approximately 40-50 feet. However, as stated above, UH requested that the landscaping effort avoid planting of large trees. In addition, the steep and rocky terrain in this portion of the Project area make construction of new service roads challenging and costly, such that vehicular access to the western-southwestern boundary is not feasible and landscape installation and maintenance would be unsafe and cost prohibitive. Similarly, landscape irrigation in this location would require pumping and storage of water approximately 130 feet above the nearest access road. For these reasons, installation of landscaping along the western-southwestern boundary of the Project area was determined to be infeasible. Regardless, the existing vegetation along the western-southwestern boundary beyond the Project fence would be preserved, which is expected to provide a visual buffer and soften views of the Project from various vantage points.

Based on the results of the evaluation process described above, the landscape plan includes clustering of primarily native plant material along the eastern boundary of the Project area facing the H-1 Freeway and Farrington Highway. Species to be planted would include ʻaʻaliʻi (*Dodonaea viscosa*), kuluʻi (*Nototrichium sandwicense*) and ʻilima (*Sida fallax*). This palette was selected based on feedback received during the community outreach process, and is in keeping with AES' desire to support the reintroduction of species indigenous to the region. In addition, ʻilima was specifically identified and incorporated into the plan as an important food source for honeybees and would support the compatible agricultural activities through honey production. Although the landscaping would not completely screen the Project facilities, it would yield additional environmental and agricultural benefits to further support the community's vision and statewide goals related to agriculture and energy.

Overall, the proposed landscaping species are relatively drought tolerant and are well suited for the arid conditions, but would require regular watering during the initial establishment phase. As the Project area lacks water transmission infrastructure, water would need to be transported and stored onsite for irrigation purposes. A temporary irrigation system would be installed (consisting of an approximately 1000-gallon water storage tank, mainline and lateral piping, and in-line drip tubing), with water delivered via a water truck to fill/refill the water storage tank. The anticipated water demand for the proposed landscaping is approximately 6,100 gallons/year, which would require a water truck to refill the tank approximately 6-7 times per year.

The landscape plan, which is contained in Attachment H (Drawings L1, L2 and L3), shows the location of proposed landscaping, and provides details regarding the plant types and size, spacing for installation, and irrigation system. Supporting information regarding the approach and evaluation process is provided in Attachment K. The plant materials and irrigation system would be routinely inspected for a full year following installation, with replacement of dead plants, application of fertilizer, and repair of irrigation components as needed.

3.3.5 Post-Construction Site Control

In addition to revegetation of temporarily disturbed areas, permanent BMPs would be implemented to address long-term stormwater requirements. To the extent practicable, the BMPs would incorporate low impact development (LID) design strategies and source control measures, in accordance with the requirements of the City and County of Honolulu's Rules Relating to Water Quality. The specific strategies and measures would be identified as part of a Stormwater Quality Strategic Plan, which would be submitted for approval prior to construction. As further discussed in Section 6.1, specific BMPs would address retention and biofiltration of stormwater.

3.4 Operations and Maintenance

Following construction and commissioning, the Project would generally involve passive operations for both solar power generation and agricultural activities. Normal operation of the Project would not require onsite personnel and, therefore, the facility would not be manned on a daily basis. Metering equipment would send solar photovoltaic system performance and production data to continuously-monitored servers; electronic notification would be sent to the operations and maintenance team if these data indicate the system is underperforming. If necessary, a technician would be dispatched to the Project to address any issues. AES would employ dedicated staff to remotely monitor the Project on a full-time basis.

Periodic maintenance and inspection of the facilities would occur intermittently over the course of Project operations, and would include testing and replacement of component parts on the inverters, transformers and substation equipment. Decommissioned parts would be salvaged or recycled to the extent feasible or properly disposed of in accordance with applicable regulations, consistent with the approach described in Section 3.5.

Vegetation within the Project area would be managed throughout the life of the Project. In addition to possible livestock grazing as part of the onsite agricultural activities, vegetation management could also include mowing, weed whacking, and localized application of herbicide, if needed. Vegetation would be actively monitored to ensure the cover is sufficient for erosion control as well as for agricultural purposes.

3.5 Decommissioning

Based on the approved PPA with Hawaiian Electric, the Project is expected to have an operational life of approximately 25 years. At that point in time, the facility may be re-powered under a re-negotiated PPA (with subsequent permits/approvals) or decommissioned. In accordance with the requirements of HRS § 205-4.5(a)(21) as well as the terms of the Option Agreement to Grant System Easement with UH (see Item III(2)(g) on page 12 of Attachment B), decommissioning would involve removal of all equipment associated with the Project and returning the Project area to substantially the same condition as existed prior to Project development. As further required by HRS § 205-4.5(a)(21), financial assurance for decommissioning would be provided to the City and County of Honolulu Planning Commission prior to the commencement of commercial generation. The financial security would be in the form of a parent guaranty or letter of credit, with the security to remain in place for the duration of the Project. The

activities that would be expected to occur as part of decommissioning are summarized below and described in further detail in the Decommissioning Plan (Attachment L).[17]

Decommissioning would commence once the Project has been fully de-energized and isolated from all external electrical connections, in coordination with Hawaiian Electric. Consistent with the measures described for construction and operation of the Project, BMPs would be implemented and maintained throughout the decommissioning phase as needed to avoid and minimize potential impacts to the surrounding environment, particularly those related to dust, erosion and stormwater. Once the site has been adequately prepared for decommissioning, the following equipment would be removed: (1) solar photovoltaic modules and racking system, including steel posts, (2) battery units, (3) inverters and transformers, (4) electrical wiring and connections, (5) substation components, (6) communication equipment, and (6) fencing.[18] All foundations would also be removed. The decommissioning would be conducted in accordance with industry standards, with all equipment and materials treated according to the highest and best use. Equipment and materials would be salvaged or recycled to the extent feasible and in coordination with licensed sub-contractors, local waste haulers and/or other facilities that recycle construction/demolition waste; the remaining materials would be disposed of by the contractor at authorized sites on O'ahu, in accordance with applicable laws. All waste requiring special disposal (e.g., transformers) would be handled according to regulations that are in effect at the time of disposal. Following removal of Project equipment, site restoration would be conducted such that the physical conditions of the Project area are returned to substantially the same condition as existed prior to Project development; these activities would include (1) removal of gravel and other aggregate material, (2) localized grading and disking to match surrounding elevations and/or aerate soil, (3) replacement of topsoil, and (4) revegetation of disturbed areas with an appropriate hydroseed mix. Decommissioning would occur within 6-12 months of the conclusion of Project operation. Decommissioning plans would be communicated with the landowner, the public and the regulatory agencies, prior to and during the decommissioning phase, as appropriate.

3.6 Project Schedule

Construction of the Project is expected to require approximately 9 to 12 months, beginning once all permits and approvals have been obtained. It is currently anticipated that construction would begin in 2021, with commercial operation commencing in 2022. Once operational, the Project is expected to have an operational life of approximately 25 years. Decommissioning would occur within 6-12 months of the conclusion of Project operations.

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[17] Decommissioning activities would be conducted in accordance with all relevant ordinances and regulatory requirements that are in place at the time of decommissioning. Because decommissioning would not be expected to occur for many years, and given that regulatory requirements could change, the applicable permitting and regulatory requirements would be reviewed with the appropriate local and state agencies prior to decommissioning activities to ensure compliance.

[18] The extent to which the service roads, infiltration trenches and landscaping within the Project area would be removed would be coordinated with the landowner at the time of decommissioning.

4 Infrastructure Requirements

The Project would not require public infrastructure improvements or burden existing infrastructure. The following sections summarize the Project infrastructure requirements related to wastewater, water supply, drainage and flooding, and streets and transportation.

4.1 Wastewater System

The Project facilities would not generate any sanitary wastewater. As operation of the facilities would not require full-time, on-site staff, no sanitary wastewater system would be required. Portable sanitation units would be brought onsite during construction, as needed.

4.2 Water Supply

Water would be required during construction and operation for dust control, vehicle washdown, temporary irrigation of the landscaping, and for the proposed agricultural activities (e.g., filling of the cattle water troughs). Total water consumption for both construction and operation of the Project would be minimal, likely using temporary water tanks (filled using water trucks) or through a connection to the existing East Kapolei 440' Reservoir, subject to further coordination with the Board of Water Supply and UH. No connection to the domestic water system is expected to be required.

4.3 Drainage and Flooding

No stormwater drainage facilities are located within or surrounding the Project area. In general, stormwater flows across the site toward the natural drainage features. The Project would not significantly alter the existing drainage patterns within the Project area and would incorporate stormwater BMPs both during construction and throughout operation, as further discussed in Section 6.1. As the Project would not direct additional stormwater flows to the stormwater drainage system and would minimize the potential for increased discharge of sediment or other pollutants, significant impacts to the stormwater drainage system are not anticipated. Accordingly, it is expected that the Project would be in compliance with the City and County of Honolulu's Rules Relating to Water Quality and Storm Drain Standards.

The Project is located in an area designated as Flood Zone D, where analysis of flood hazards has not been conducted and flood hazards are undetermined (see Figure 12; Attachment A). No portion of the Project area is within a special flood hazard zone. It is also more than 4.5 miles inland from the tsunami evacuation zone, and more than 3.5 miles inland from the extreme tsunami evacuation zone (see Figure 13; Attachment A).

4.4 Streets and Transportation

As described in Section 2, the UH West Oʻahu Mauka Lands property is accessed via Pālehua Road, which extends north then west from the intersection of Kualakaʻi Parkway and H-1 Freeway, with entry controlled by an existing gate and 24-hour security. From the gated entry on Pālehua Road, access to the Project area would be via a network of former plantation roads within the UH West Oʻahu Mauka Lands property. The portion of Pālehua Road and the existing access roads that would be used to access the Project area are located entirely on land owned by UH; the agreement with UH will include a non-exclusive access easement to allow use of these roadways for the Project.

Within the Project area, a series of new service roads would be installed to accommodate construction vehicles and to allow ongoing access for operations and maintenance. These roads would have a compacted gravel bed with a width of approximately 10 feet (plus compacted 5-foot shoulders), as well as the required clearance and turning radius needed for emergency response vehicles in accordance with fire code. No centralized parking facilities are planned for the Project.

The Project is not expected to involve any construction or improvements within any state or county roadway. However, the roadway network would be used by construction workers and for equipment deliveries to the Project area. As further discussed in Section 6.10.1, a Traffic Impact Analysis Report (TIAR) was prepared for the Project and concluded that Project construction is not expected to measurably affect the overall level of service at the signalized intersections adjacent to the Project area. However, recognizing that construction could result in minor, localized impacts to traffic and the roadway network, a Traffic Management Plan (TMP) would be prepared prior to construction. The TMP would detail the measures that would be implemented to avoid, minimize and mitigate potential impacts to the surrounding roadway network based on Complete Streets principles. Further information regarding the anticipated measures is provided in Section 6.10.1.

5 Agency and Stakeholder Input

5.1 Community Outreach and Agency Coordination

Subsequent to the Project being selected for development through the Hawaiian Electric RFP process, AES initiated early consultation with key community leaders and elected officials to introduce the Project and to seek preliminary input. The initial outreach efforts also included notification regarding a community meeting; the purpose of the meeting was to provide an overview of the Project and to solicit feedback from the broader community. In addition to strategic community outreach, a community meeting notice was mailed to approximately 2,264 addresses in the adjacent Makakilo neighborhood. The community meeting was held on February 26, 2019; a total of 19 individuals attended the meeting. Additional detail regarding the community meeting is provided in the Community Meeting and Outreach Summary Report (contained in Attachment M).

AES has continued to conduct outreach and consultation through follow-up meetings and written correspondence with a range of community leaders, neighborhood associations, adjacent landowners, interested organizations and individuals, as well as regulatory and resource agencies with jurisdiction related to the Project; the list of specific parties engaged through these efforts is provided in Table 3. In addition to these efforts, a website was published for the Project (www.westoahusolar.com), with a dedicated email for receiving input regarding the Project.

Table 3. Summary of Agency Consultation and Community Outreach Conducted To Date

Name / Entity	Date	Description
City Council Member Kymberly Pine, District 1	January 29, 2019	Meeting to discuss Project and request input; Provide community meeting notice
State Senator Mike Gabbard, District 20	February 11, 2019 February 21, 2019	Meeting to discuss Project and request input; Provide community meeting notice
State Representative Ty Cullen, District 39	February 19, 2019 Oct 8, 2019	Meeting(s) to discuss Project and request input; Provide community meeting notice
State Representative Sharon Har, District 42	February 21, 2019	Meeting to discuss Project and request input; Provide community meeting notice
Neighborhood Board members	February 11, 2019 August 26, 2019	Meeting to discuss Project and request input; Provide community meeting notice
Representative community members[1]	February 22-26, 2019 May 31, 2019 July 20, 2019 August 26, 2019	Meeting to discuss Project and request input; Provide community meeting notice
Villages of Kapolei Association	February 11, 2019 July 16, 2019 August 26, 2019	Outreach to discuss Project and request input; Provide community meeting notice
Pālehua Community Association	February 11, 2019 August 26, 2019	Meeting to discuss Project and request input

Name / Entity	Date	Description
Wai Kaloʻi Community Association	August 26, 2019 September 9, 2019	Meeting to discuss Project and request input
City and County of Honolulu Department of Planning and Permitting staff	April 2, 2019	Meeting to discuss Project and request input
State of Hawaiʻi Land Use Commission staff	September 9, 2019	Meeting to discuss Project and request input
Malama Learning Center	July 11, 2019	Discuss potential for compatible agricultural activities
Sheep Rancher	July 20, 2019	Discuss potential for compatible agricultural activities
Hui Kū Maoli Ola	July – August 2019 February – March 2020	Discuss potential for compatible agricultural activities; potential educational partnerships for ʻāina-based learning
Aloha Bee, LLC	July - December 2019	Discuss and develop plans for compatible agricultural activities
Rocker G Livestock	October 24, 2019 July 11, 2019 January 16, 2020 February 11, 2020	Discuss and develop plans for compatible agricultural activities
City and County of Honolulu Fire Department	November 14, 2019	Discuss requirements with Fire Prevention Bureau
Grace Pacific	August – December 2019	Discuss traffic and access, water resources, other community and land use issues
University of Hawaiʻi Office of Sustainability Uluniu Project	February - May 2020	Discuss potential for incorporating cultural components as part of landscaping
Hawaiʻi Farm Bureau	May 21, 2020	Meeting to discuss Project and request input
[1.] A listing of specific community members that have been engaged in the public outreach effort is provided in the Community Meeting and Outreach Summary Report (contained in Attachment M).		

Key issues and concerns identified through community outreach and agency coordination for the Project to date and the efforts to address them are summarized below.

- **Agricultural Activities:** Project stakeholders have raised questions regarding the potential impacts to agriculture. As described in Section 3.2, the Project area would be made available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties, pursuant to HRS § 205-4.5(a)(21). Furthermore, AES has evaluated the feasibility of a range of potential agricultural activities, and has proactively engaged and sought out compatible agriculture partners. As part of this effort, AES engaged the services of former Hawai'i Department of Agriculture Chairperson and Deputy Director Scott Enright to assist in developing a compatible agricultural plan for the Project. With the input and counsel of Mr. Enright, AES has worked with potential partners to develop opportunities that go beyond the statutory requirements to simply provide land for complementary agricultural uses, and instead seek to provide meaningful contributions and generate agricultural products.

- **Visual Impacts:** The potential for visual impacts to the surrounding community has been identified as an important consideration. In response to this concern, AES incorporated a sensitive siting approach into the design process, with the Project designed and laid out to reduce visual impacts from neighboring areas to the extent possible. As discussed in Section 3.3.4, landscaping would be installed to provide visual buffering of Project facilities from adjacent areas to the extent practicable. As further discussed in Section 6.6, detailed visual analyses have been conducted to characterize the potential views of the Project and to inform the Project development efforts.
- **Traffic and Access:** Community members have raised concerns about access along Makakilo Drive and the potential for Project related-traffic. As part of the Project development process, AES coordinated with both UH West O‘ahu and Grace Pacific to confirm access to the Project area from Pālehua Road, such that the Project would not involve any access via Makakilo Road. In response to concerns about traffic, a TIAR was conducted; as further discussed in Section 6.10, this analysis concluded that the Project would not measurably impact traffic during either construction or operation. To further minimize traffic-related impacts during construction, AES would also prepare and implement a TMP.
- **Vandalism and Safety:** Community members have raised concerns about safety and vandalism and requested information regarding how the Project would address these issues. As discussed in Section 2, entry to the UH West O'ahu Mauka Lands property is controlled through a 24-hour security service. In addition, AES would staff the Project area with security personnel, as needed during construction.
- **Decommissioning:** Project stakeholders have pointed to the need for proper decommissioning and a firm commitment to implement those activities. As discussed in Section 3.5, a decommissioning plan has been prepared for the Project and would include removal of all Project-related equipment, with the Project area returned to substantially the same condition as existed prior to development. In accordance with the requirements of HRS § 205-4.5(a)(21), financial assurance for decommissioning would be provided to the City and County of Honolulu Planning Commission prior to the commencement of commercial generation.
- **Opportunities for Continued Public Input:** Community leaders have emphasized community concerns related to projects that do not provide adequate opportunities for stakeholder input. As detailed above, community engagement efforts to date have included a community meeting, follow-up discussions with neighborhood associations and adjacent landowners, and a Project website. As further discussed below, input was also sought from more than 80 agencies, elected officials, organizations, interested individuals and other stakeholders through the HRS § 343 environmental review process. The Special Use Permit process also includes additional opportunities for public input, and AES will continue to proactively engage the community through the remainder of the Project development process.

5.2 HRS § 343 Scoping and Public Review

In addition to the general community outreach and agency coordination described above, additional consultation was conducted specifically for the HRS § 343 environmental review process. This effort included consultation with DPP as the approving agency for the EA, pre-assessment scoping and distribution of the Draft EA for public comment, in accordance with the requirements of HRS § 343 and HAR § 11-200.1.

During pre-assessment scoping for the Draft EA, letters inviting comments regarding issues that the EA should address were sent to federal, state and county agencies, as well as elected officials, organizations and interested individuals. Subsequently, a notice regarding availability of the Draft EA for public review and requesting comments was sent to these parties, as well as additional stakeholders identified through the Project planning process. In total, more than 80 agencies, elected officials, organizations, interested individuals and other stakeholders were engaged through the HRS § 343 environmental review process; a detailed list of these stakeholders is included in Section 7 of the EA. Table 4 summarizes the comments received during the 30-day Draft EA review period; copies of the comment letters are contained in Appendix N of the Final EA. These comments were incorporated into the Final EA, as well as this Special Use Permit application.

Table 4. Summary of Draft EA Comments

Commenting Party	Summary of Comments
Tom Berg	- States it is premature to develop solar project on the property as an extensive survey for Hawaiian hoary bat and pueo has not been conducted - Provides copy of testimony in response to Senate Bill 2755 Relating to Pueo Research - Suggests that support for House Concurrent Resolution 170, which relates to development of a map that defines the most suitable area within Honouliuli Gulch for a dedicated pueo preserve, could provide mitigation for habitat loss - States that grow lights associated with agricultural activities on adjacent properties may be reflected by solar panels and affect migratory species
State of Hawai'i Department of Accounting and General Services	No comment at this time
Honolulu Fire Department	- Summarizes requirements for fire department access roads, water supply to provide fire flow, and fire apparatus access roads; requests submittal of civil drawings to DPP for review and approval
U.S. Fish and Wildlife Service	- Provides federally listed species that may occur or transit through the vicinty of the Project area; states that there is no critical habitat within Project area - Summarizes potential impacts and impact avoidance measures for the Hawaiian hoary bat, Hawaiian waterbirds and Hawaiian seabirds - States that implementation of impact avoidance measures typically allows for determination of no adverse effects
City and County of Honolulu Police Department	- Recommends that the contractor address potential security issues with regards to construction equipment and machinery, as well as the location of the solar modules and battery storage to be kept on site during operations

Commenting Party	Summary of Comments
State of Hawai'i Office of Planning	- Summarizes the relevant land use designations and permitting requirements for the proposed Project, including those related to the 'Ewa Development Plan, City and County of Honolulu Land Use Ordinance, and State Land Use Law (HRS § 205) - Summarizes the agricultural activities that are currently planned within the Project area, including honey production and cattle grazing, and notes the compatibility of these uses with solar facilities - Reiterates the findings that no federally or state listed plant species were observed in the Project area; notes that the endemic wiliwili tree occurs within Kalo'i Gulch but would not be impacted - Notes that the EA describes proposed mitigation measures for listed wildlife species including the Hawaiian hoary bat, pueo, Hawaiian seabird and waterbird species - Summarizes the findings and recommendations of the Archaeological Inventory Survey (AIS) and acknowledges that the AIS report is pending review and concurrence by SHPD; states that letter from SHPD should be obtained prior to the Special Use Permit decision by the City - Summarizes the approach and findings of the CIA and specifically references the input provided by Ms. Lynette Paglinawan regarding ao kuewa (wandering spirits) in the vicinity of the Project area; states that EA should indicate if recommendation to plant trees will be incorporated into the Project - Summarizes the impact analysis relative to glare and radio frequency interference on airport facilities, and acknowledges the commitment to immediately mitigate any glare or radio frequency interference hazards upon notification by FAA and/or DOT Airports Division - Acknowledges that the Office of Planning's pre-assessment scoping comments and responses to those comments are included in Appendix M of the EA
University of Hawai'i, Dean of the College of Engineering	- Expresses support for the Project; references the various benefits of the Project and emphasizes the value of using state land to help meet the renewable energy goal while also generating revenue for UH
State of Hawai'i Department of Hawaiian Home Lands	- Acknowledges the discussion of job generation; recommends development of a system to target local residents for job opportunities and partnering with employment training programs like Alu Like - Encourages continued consultation with Hawaiian Homestead community associations and other (N)native Hawaiians organizations
University of Hawai'i, Office of Project Delivery	- Provides support for the Project, noting it is consistent with UH policies and objectives; emphasizes that the Project would contribute to the RPS renewable energy goal, as well as reduce greenhouse gas emissions, while preserving long-term agricultural uses; reiterates the extent to which the Project is expected to offset the use of fossil fuels and decrease greenhouse gas emissions, and notes the creation of "green jobs"
State of Hawai'i Department of Transportation, Airports Division	- Reiterates the applicability of TAM-2016-1 and notes that EA addresses concerns raised by HDOT Airports Division including parabolic troughs, heliostats, mirrors and power towers - Reiterates the need to file FAA Form 7460-1 Notice of Proposed Construction or Alteration for projects within three nautical miles of an airport or having footprints approaching one acre - Reiterates the use of the FAA Notice Criteria Tool and the Solar Glare Hazard Analysis Tool - Emphasizes the need to immediately mitigate radio frequency interference upon notification by the HDOT Airports Division and/or FAA - Notes that thick smoke plumes in the protected airspace are hazardous to aircraft operations and states that applicant should ensure that the battery storage facility has an adequate fire suppression system and unobstructed access for emergency and fire fighting vehicles
State of Hawai'i Department of Transportation, Highways Division	- Acknowledges the responses to the pre-assessment scoping comments - Reiterates that no stormwater runoff would be directed to a state highway - Notes that no construction or improvements would occur within the state ROW - Summarizes the conclusions relative to visual impacts from H-1 Freeway - Summarizes the findings of the TIAR and the conclusion that the Project would not measurably impact traffic during either construction or operations, but would still include TMP - States that an HDOT permit is required to transport oversized/overweight loads on HDOT roadways

Commenting Party	Summary of Comments
City and County of Honolulu Department of Planning and Permitting	- States that the EA should include clarification that the proposed revised General Plan was re-introduced by the City Council as Resolution No. 20-44 - Confirms that the Project is considered a "Type B Utility Installation" and is required to obtain a CUP minor, in accordance with the LUO. The comment also states that the EA and CUP minor application should discuss compliance with the applicable development standards in Article 3 of the LUO, as well as other development standards such as parking, access, fencing and landscaping - States that the Project's compliance with the Rules Relating to Water Quality and Storm Drainage Standards will be verified when the grading plans are submitted to DPP for review - Requests additional visual simulations from specified viewpoints - Recommends that the site plans and visual simulations include the battery storage structures - Requests clarification why the western portion of the site is included in the Project area and/or Special Use Permit (SUP) boundary as it does not include any proposed improvements - Requests additional information as to the feasibility of other forms of agriculture; also requests clarification regarding sources of water and pollen for bees - Notes that portions of H-1 Freeway and Kualakaʻi Parkway are shown in Figure 1-4 as privately owned; requests clarification as to whether these roadway portions are still in private ownership or have been (or are being) transferred to the government - Requests clarification as to whether all construction staging, construction vehicle storage/maintenance, concrete washout, and any storm or other wastewater containment areas would be located within the Project area - Requests that EA describe the final disposition of the cultural remains in the Project area; also states that a copy of SHPD's response to the AIS must be included in the SUP application.
Hawaiʻi State Energy Office	- Recommends that AES continue its efforts to (1) seek and incorporate community input throughout Project permitting and development and (2) work with local agricultural interests to ensure the Project's compatibility with Hawaii's agriculture industry - Recommends the EA summarize the primary concerns voiced during community outreach and how AES is addressing them - Recommends the EA provide the most currently available data on the amount of electricity (percentage-wise) the Project would contribute to the state's overall renewable energy portfolio - Recommends the EA provide information on the expected savings to Oahu ratepayers - Recommends the EA explain if/how the Project would contribute to retirement of AES's coal plant and the potential impact relative to the coal plant retirement should the proposed action not occur - Encourages AES to use local workforce and support local workforce development programs - Suggests the EA quantify the economic benefits such as income to the landowner and those related to compatible agricultural activities to summarize the total economic benefits of the Project - Recommends the Hawaiʻi Farm Bureau be added to the list of stakeholders to be consulted during Project scoping and development
State of Hawaiʻi Department of Health	- Provides the Clean Air Branch's standard comments (https://health.hawaii.gov/cab/files/2019/04/Standard-Comments-Clean-Air-Branch-2019.pdf)
City and County of Honolulu, Department of Transportation Services	- Reiterates that any existing pedestrian, bicycle and vehicle access/crossing shall be maintained with the highest safety measures during construction - States that a street usage permit should be obtained for any construction-related work requiring temporary closure of any traffic lane on a City street - States that Project plans should be reviewed and approved by DCAB to ensure full compliance with American with Disabilities Act requirements - States that construction materials and equipment should be transported to and from the Project site during off-peak traffic hours (8:30 am to 3:30 pm) - States that the area representatives, neighborhood board, area residents, businesses, emergency personnel, Oahu Transit Services, Inc., etc., should be kept apprised of the Project details and status

5.3 Neighborhood Board Presentation

Community outreach efforts to date, as well as notification regarding the HRS § 343 EA scoping and review processes have included the chairperson and members of the Makakilo/Kapolei/Honokai Hale Neighborhood Board as well as neighboring community associations. In parallel with the HRS § 343 environmental review process and in anticipation of the Special Use Permit application, AES planned to provide a presentation to the neighborhood board in Spring 2020. However, due to the emergency proclamation and supplemental orders by the Governor in response to COVID-19, all neighborhood board meetings were suspended through June 2020. Communication with the chairperson of the Makakilo/Kapolei/Honokai Hale Neighborhood Board was maintained through this period, and AES requested to be added to the agenda for the soonest possible neighborhood board meeting. The Makakilo/Kapolei/Honokai Hale Neighborhood Board reconvened on August 26, 2020; the Project was included as Item XIII(7) on the meeting agenda. As part of the meeting, AES representatives provided a presentation regarding the proposed Project and stated that additional updates would be provided over the course of the Project planning and development process; no action was taken by the neighborhood board. A copy of the meeting agenda is included as part of Attachment M; meeting minutes were not yet available at the time the SUP application was filed with DPP.

6 Potential Impacts and Mitigation Measures

Based upon the analysis and findings presented in the Final EA, implementation of the Project is not expected to result in a significant adverse direct, indirect, or cumulative impact on the quality of the environment. The following sections summarize the potential impacts and the key avoidance, minimization, and mitigation measures described in the Final EA that inform and support this conclusion. Additional detail and supporting discussion related to the impact analysis is provided in the Final EA.

6.1 Water Resources

The Project has been designed to avoid surface water features within the Project area to the maximum extent practicable. The only direct impacts to surface water features would be associated with construction of a single crossing over the tributary to Kaloʻi Gulch that runs through the central portion of the Project area to allow for access between the solar arrays; it is anticipated that the crossing would involve installation of a box culvert. As this feature has been determined to be non-jurisdictional, construction of the road crossing would not require authorization under the Clean Water Act. Regardless, the crossing would be designed to have as small of a footprint as possible and to sufficiently convey flows during and following rain events.

To minimize the potential for indirect impacts (such as changes in drainage patterns, increased volume or velocity of stormwater runoff, and/or discharge of pollutants to downstream waters), the Project would incorporate LID design techniques (specifically, Site Design Strategies) to maintain hydrologic and hydraulic functions and reduce the potential for erosion within the Project area. The Site Design Strategies would consist of conserving natural areas, including soils and vegetation, minimizing soil compaction, and minimizing disturbance to the natural drainages, such that the Project would not significantly alter the existing drainage patterns within the Project area.

The Project would increase the amount of impervious surface within the Project area, which would increase stormwater runoff.[19] Based on the permanent Project footprint (as listed in Table 2), it is expected that impervious surfaces would increase by approximately 2.2 acres across the overall Project area. Other than the area occupied by the support foundations for the racking system, the ground beneath the solar photovoltaic modules would be maintained as a natural, pervious surface that is able to absorb and infiltrate stormwater. Disturbances to vegetated areas around the solar modules would be mitigated through hydroseeding, such that erosion would not be expected to occur downgradient of the modules. To further minimize the potential for stormwater-related impacts, the Project would also

[19] The City and County of Honolulu's Rules Relating to Water Quality define an impervious surface as "a surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/ storm water. Impervious surfaces include, but are not limited to rooftops, walkways, patios, driveways, parking lots, storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering."

incorporate stormwater retention measures during and post-construction to retain and treat stormwater within the Project area.

Construction of the Project could temporarily increase sediment and other pollutants (for example, trace oil, grease, and fuel) in stormwater runoff, which could affect water quality in downstream waters. Prior to construction of the Project, an Erosion and Sediment Control Plan (ESCP) would be prepared and submitted for approval in accordance with the requirements of the City and County of Honolulu's Rules Relating to Water Quality. In addition, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared as part of the application for Notice of General Permit Coverage for construction-related stormwater runoff, pursuant to National Pollution Discharge Elimination System (NPDES) regulations. The ESCP and SWPPP would identify BMPs including erosion prevention, sediment control, and good housekeeping measures that would be implemented to prevent and minimize discharge of pollutants to downstream waters; the specific BMPs that are expected to be included in the ESCP and SWPPP are detailed in Section 3.3.2.2 of the Final EA. The measures would be inspected by a designated ESCP Coordinator on a regular basis, with documentation of the inspection results and implementation of necessary corrective actions.

In addition to the construction BMPs, permanent features would be installed to provide long-term retention and biofiltration of stormwater within the Project area. Specifically, infiltration trenches would be installed in areas with increased impervious surfaces associated with the Project facilities and would be designed to retain and allow for infiltration or evapotranspiration of stormwater, as needed to reduce peak flows to pre-development values. The size and design of the trenches would be based on site-specific conditions as well as the requirements of the City and County of Honolulu's Rules Relating to Water Quality and Storm Drainage Standards; additional detail regarding the quantification of stormwater runoff and sizing of the infiltration trenches is provided in the Stormwater Management Design Memo contained in Attachment N.[20] A Storm Water Quality Strategic Plan detailing the permanent stormwater design strategies, including the infiltration trenches, would be developed and submitted to DPP for approval prior to construction. The post-construction BMPs would be inspected during and following installation by a Certified Water Pollution Plan Preparer, with proper documentation of the inspection results and implementation of necessary corrective actions.

Implementation of BMPs, which would be detailed as part of an approved ESCP, SWPPP and Storm Water Quality Strategic Plan, would minimize the potential for discharge of sediment and other pollutants in stormwater runoff, such that significant water quality impacts to downstream waters are not anticipated. Accordingly, it is expected that the Project would be in compliance with the City and County of Honolulu's Rules Relating to Water Quality and Storm Drain Standards, as well as the State's

[20] The current stormwater management design is based on an approximately 60 percent level of design. The calculations will be refined through the final design process. Any refinements are expected to be relatively minor, such that the calculations and resulting stormwater management features would not substantively differ from those described. The final stormwater management design will be submitted to DPP as part of the Storm Water Quality Strategic Plan.

water quality standards, which establishes basic water quality criteria and requires that water quality be maintained to protect existing uses as specified in HAR § 11-54.

6.2 Biological Resources

6.2.1 Vegetation

Direct impacts to vegetation would occur primarily as a result of clearing and ground disturbance during construction. However, as described above, the Project area has been extensively disturbed as part of previous agricultural operations, with existing vegetation largely comprised of non-native species. No federally or state listed endangered, threatened, or candidate plant species have been identified within the Project area, and no portion of the Project area has been designated as critical habitat for any listed plant species. The three indigenous plant species that occur within the Project area - hoary abutilon, ʻilima and ʻuhaloa - are common throughout the Hawaiian Islands. The endemic wiliwili tree occurs within the tributary to Kaloʻi Gulch along the southern boundary of the Project area; however, this species would not be directly impacted by the Project because no ground disturbance would occur within the gulch.

Following construction, all temporarily disturbed areas would be revegetated to stabilize soil and prevent erosion. It is anticipated that revegetation would involve application of hydroseeding using a suitable mix of native and/or non-invasive grass species. In addition to revegetation of temporarily disturbed areas, landscaping would also be installed to provide visual buffering of Project equipment from adjacent areas to the extent practicable. As discussed in Section 3.3.4, landscaping would incorporate suitable plant material in key locations and would include native species that are ecologically and culturally appropriate for this location, as practicable.

Ground disturbance, as well as the movement of construction and operation equipment and personnel in the Project area, could also indirectly impact vegetation through the introduction or spread of invasive species. To minimize the potential for introduction and spread of invasive species, the following measures would be implemented:

- Construction equipment, materials and vehicles arriving from outside of the island of Oʻahu would be washed and/or visually inspected (as appropriate) for excessive debris, plant materials, and invasive or harmful non-native species before transportation to the Project area; import of materials that are known or likely to contain seeds or propagules of invasive species would be prohibited.
- Due to concerns with spreading the fungal pathogen responsible for Rapid ʻŌhiʻa Death, no plants, clothing, or gear sourced from Hawaiʻi Island would be permitted for use within the Project area. All other equipment, tools, or vehicles sourced from Hawaiʻi Island would follow established Rapid ʻŌhiʻa Death decontamination protocols.
- Offsite sources of revegetation materials (such as seed mixes, gravel, and mulches) would be certified as weed-free or inspected before transport to the Project area.

- All areas that are hydroseeded would be monitored for six months after hydroseeding to identify invasive plants that establish from seeds inadvertently introduced as part of the seed mix; all invasive plants identified within the hydroseeded areas would be removed.

Following construction, little to no ground disturbance is anticipated during Project operations. Vegetation within the Project area would be routinely managed either through grazing animals and/or mechancial means. Operations staff and agricultural partners would actively monitor the vegetation to ensure the cover is sufficient for erosion control while ensuring an adequate food supply for livestock. Decommissioning of the Project, at the end of its useful life, would involve removal of the Project facilities and returning the site to its existing condition (or similar), including revegetation with a suitable mix of species.

6.2.2 Wildlife

The Project area has been extensively disturbed by previous agricultural activities, which has reduced the presence of native wildlife and their suitable habitats. Nearly all of the wildlife observed during the biological survey are non-native species. Although not observed, several threatened and endangered wildlife species could occur within or traverse over the Project area; as discussed in Section 2.6.2.1, these species include ʻōpeʻapeʻa or Hawaiian hoary bat, pueo or Hawaiian short-eared owl, and Hawaiian seabird and waterbird species.

The measures listed below would be implemented to avoid and minimize potential Project-related impacts to wildlife, including federally and state-listed species. These measures incorporate recommendations provided by USFWS and DOFAW in response to a request for input regarding potential species occurrence and measures to avoid and minimize impacts to those species; copies of the correspondence from USFWS and DOFAW are contained in Attachment O.

- No trees or shrubs greater than 15 feet tall would be disturbed, trimmed or removed during the Hawaiian hoary bat birthing and pupping season (June 1 through September 15).
- Any fences that are erected as part of the Project would not have barbed wire to prevent entanglements of the Hawaiian hoary bat, unless required for safety and security purposes (e.g., surrounding the electrical substation).
- A wildlife education and observation program (WEOP) would be implemented for all construction and regular on-site staff. Staff would be trained to identify listed species that may be found on-site (including Hawaiian hoary bat, pueo, Hawaiian seabirds and waterbirds) and to take appropriate steps if these species are observed. If a federally or state-listed species is observed to be impacted by the Project, a systematic post-construction monitoring program would be developed and implemented, as appropriate.
- Speed limits would be established and enforced within the Project area and along the access road.

- Construction activities would be restricted to daylight hours as much as possible during the seabird peak fallout period (September 15–December 15) to avoid the use of nighttime lighting that could attract seabirds.
- Should nighttime construction be required during the seabird peak fallout period, a biological monitor would be present in the construction area from approximately 0.5-hour before sunset to 0.5-hour after sunrise to watch for the presence of seabirds. Should a seabird (or other listed species) be observed and appear to be affected by the lighting, the monitor would notify the construction manager to reduce or turn off construction lighting until the individual(s) move out of the area.
- Any on-site lighting would be fully shielded, triggered by motion detector, and fitted with light bulbs having a correlated color temperature of four thousand Kelvin or less, to the extent possible. Lighting would also be directed away from the solar arrays to minimize the potential for reflection and would only be used when necessary.
- Construction of overhead lines would be minimized to reduce the collision risk for seabird species.
- Prior to clearing vegetation within the Project area, pre-construction pueo surveys would be conducted by a qualified biologist following the Pueo Project survey protocol. If a ground nest or an owl nesting on the ground is observed, an approximately 50-foot buffer would be established and marked in the field. In accordance with existing protocol for UH West Oʻahu, a designated UH West Oʻahu representative would be contacted immediately, and that representative would provide notification to DOFAW. No vegetation clearing would occur until pueo nesting ceases.
- If a live pueo is observed on-site by Project staff all activities within 50 feet of the bird would cease, and the bird would not be approached.
- No rodent baiting would occur as part of the Project to prevent secondary poisoning from toxins in pueo prey.
- No surface water features would be created by the Project during construction or operation to avoid attracting waterbirds to areas with sub-optimal habitat.

With implementation of these measures, the Project would not be expected to result in significant adverse impacts to wildlife, including federally and state-listed species. If circumstances arise which indicate an increased potential for the Project to adversely affect listed species, USFWS and DOFAW would be further consulted in compliance with the Endangered Species Act and HRS § 195D, respectively.

6.3 Historic Properties

As detailed in the AIS Report (Attachment F), the historic properties documented within the Project area as part of the AIS were assessed based on criteria specified in HAR § 13-284-6. The historic irrigation and

plantation infrastructure (SIHP # 50-80-08-5593) was assessed as significant because it has yielded information on land utilization and agricultural history of the ʻEwa Plain. Based on the condition and context of the plantation infrastructure remnants, no further work is recommended for those portions of SIHP # 50-80-08-5593 within the Project area; sufficient information regarding the location, extent, function, and age of the remnant infrastructure has been generated as part of the current AIS to mitigate any adverse effect resulting from the Project. The Waiahole Ditch System (SIHP # 50-80-09-2268) was also assessed as significant because it has yielded information on the agricultural history of the area and contributed greatly to the development and evolution of the ʻEwa Plain throughout its history. However, within the Project area, the historic property only retains sufficient integrity of location, which is also diminished in portions of the Project area due to erosion and neglect. While there are some portions that retain some integrity of design, materials, and workmanship within the Project area, this integrity is very diminished. While the overall ditch is significant, the remnant portion of SIHP # 50-80-09-2268 within the Project area does not retain sufficient integrity to be considered significant; therefore, no further work is recommended. This conclusion is consistent with the conclusions of the Dega et al. 1998 study, which was accepted by SHPD.

As shown on the site plan (Drawing C3 in Attachment H), portions of these features fall within the Project area. Implementation of the Project would affect those portions within the Project area; the portions that are not affected by the proposed improvements would be kept intact. Based on the conclusions regarding the significance and documentation to date, pursuant to HAR § 13-284-7 and subject to review and concurrence by SHPD, the effect determination for the Project is “no historic properties affected” with a recommendation for no further historic preservation work. AES intends to obtain SHPD’s acceptance of the AIS and concurrence with the effect determination prior to the Planning Commission hearing for the Special Use Permit application.

6.4 Cultural Resources

Based on information gathered as part of the community consultation for the CIA, participants provided input regarding potential Project-related impacts to cultural resources. Mr. Shad Kāne stated he is not in opposition to the Project, noting that the Project area has been previously disturbed by sugarcane production.

Ms. Lynette Paglinawan expressed concern regarding the effects of the Project on the ao kuewa, the realm of the homeless spirits. Based on input provided by Ms. Paglinawan, it is understood that “the area from Waimānalo Gulch over to Kapolei to the location of UHWO was known by very early residents there to be the place where ao kuewa, wandering spirits, congregated from makai to mauka up Pālehua and especially near the cluster of wiliwili trees in Kaupeʻa.” Ms. Paglinawan stated that the development of the moku of ʻEwa including the ahupuaʻa of Honouliuli resulted in the displacement of the ao kuewa, noting that “we destroyed the habitat of the ao kuewa which is the wiliwili trees.” She expressed her concerns regarding the effect of the Project on the ao kuewa, which she believes are attracted to energy. She also expressed her concerns of the effect of the spirits on the solar panels, noting “that’s high energy. It will be like going to the game room.” Ms. Paglinawan stated that the Project should be

mindful of the locations of ancient trails, as these are still used by spirits to travel from mauka to makai within Honouliuli Ahupuaʻa. Ms. Paglinawan also recommended planting "a wall of trees" surrounding the Project area as restitution to the spirits who may be displaced by the Project; she also noted that planting of "a wall of trees" around the Project area would have other benefits including the production of oxygen and providing a habitat for Native Hawaiian birds. Finally, Ms. Paglinawan expressed concern regarding psychological impacts for the people that encounter the spirits, noting trauma on workers at the UH West Oʻahu, as well as families who live in the area. She was particularly concerned for the children who encounter these spirits, noting her belief that children "see many more things than adults do." As described in Section 3.3.4, landscaping for the Project would incorporate suitable plant material in key locations and would include native species that are ecologically and culturally appropriate for this location. Ms. Paglinawan's recommendations to plant trees around the Project area as restitution to the spirits that may be displaced was considered as part of this effort.

Mr. Tom Berg expressed concern for the pueo and ōpeʼapeʼa, stating that the Project will "encroach on prime pueo habitat, considered to be graded A+ - 'a ten' - when it comes to the degree of pueo habitat in use on this project site." Mr. Berg expressed concern that the "property in question will not receive the proper protocol to conclude no endangered species inhabit the area." He recommended that "a thorough and complete protocol is adopted to repeat the inventory exercise for pueo and ʻōpeʻapeʻa over the course of a calendar year would be in order so the Project does not inadvertently contribute to more endangered species habitat loss." He also recommended consulting with Dr. Melissa Price and Dr. Javier Cotín (The Pueo Project) and Afsheen Siddiqi (DOFAW) regarding pueo survey protocol. In addition, Mr. Berg also expressed his concern for the possible negative aspects of lighting operations at an adjacent parcel which may reflect off of a solar panel into "the flight patterns of migrating birds and the ʻōpeʻapeʻa and pueo in particular need to be addressed." Consistent with the recommendations provided, both Dr. Melissa Price (Pueo Project researcher) and Afsheen Siddiqi (DOFAW biologist) were consulted and surveys were conducted for pueo following the Pueo Project survey protocol (Price and Cotín, 2018). Focused surveys were not conducted for the Hawaiian hoary bat; however, potentially suitable foraging was noted as part of the general biological survey. Although neither pueo nor Hawaiian hoary bat were observed within the Project area, both could potentially occur and have been previously documented in proximity to the Project area. Recommended avoidance and minimizations measures identified by USFWS and DOFAW, as well as input from Pueo Project researchers, have been incorporated into the Project. With implementation of the avoidance and minimization measures listed in Section 6.2.2, the Project would not be expected to significantly affect either pueo or the Hawaiian hoary bat.

As previously discussed, no historic trails are known to be extant within the Project area. As such, development of the Project area would not be expected to impact traditional Hawaiian trails or access to upland resources.

6.4.1 Ka Paʻakai Analysis

In Ka Paʻakai v. Land Use Commission, 94 Hawaiʻi 31, 74, 7 P.3d 1068, 1084 (2000), the Court held the following analysis be conducted:

- The identity and scope of valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the project area;
- The extent to which those resources–including traditional and customary native Hawaiian rights–will be affected or impaired by the proposed action; and
- The feasible action, if any, to be taken by the Land Use Commission to reasonably protect native Hawaiian rights if they are found to exist.

As described above, no cultural resources, practices, or beliefs have been identified as existing within the Project area, nor is there any indication that traditional or customary Native Hawaiian rights are currently being exercised within any portion of the Project area. Although traditional Hawaiian trails were used to travel across the ahupua‘a and for access to the nearby uplands, none of these trails are believed to be have been located within the Project area.

Based on information gathered from the cultural and historical background, and the community consultation, culturally significant resources have been identified elsewhere within Honouliuli Ahupua‘a. Although not within the Project area, documentation and testimony indicates traditional or customary Native Hawaiian rights are possessed and are currently being exercised within Honouliuli Ahupua‘a by ahupua‘a tenants who are descendants of Native Hawaiians who inhabited the Hawaiian Islands prior to 1778 (Hawai‘i State Constitution, Article XII, Section 7). While no cultural resources, practices, or beliefs were identified as currently existing within the Project area, Honouliuli Ahupua‘a maintains a rich cultural history in the exercising of traditional or customary Native Hawaiian rights. The Project is not expected to affect or impair traditional and customary Native Hawaiian rights exercised elsewhere in Honouliuli Ahupua‘a; therefore, no action needs to be taken to reasonably protect native Hawaiian rights as a result of the Project. Additional detail supporting the Ka Pa‘akai Analysis is provided in the CIA Report (Attachment G).

6.5 Agricultural Resources

As previously described, the area within and surrounding the Project area was previously cultivated as part of an extensive sugar cane and pineapple plantation that extended across O‘ahu’s ‘Ewa Plain. Since closure of the plantation in the 1990s, the Project area has not been cultivated and has been used intermittently for cattle grazing. While the Project would result in a change in the primary land use to accommodate the solar energy generation and storage components, the Project area would also be made available for compatible agricultural uses, including beekeeping and cattle production and grazing. As described in Section 3.2, use of the Project area for other agricultural uses, such as crop cultivation, is not feasible due to the arid conditions, lack of infrastructure, and insufficient water for irrigation.

As described in Section 2.4.3 and as shown on Figure 10, the Project equipment would occupy areas designated as having LSB Class B, D, and E soils. The Project would not involve construction of any facilities in areas designated as having LSB Class A soils. Table 5 provides the approximate acreage of

each LSB soil class within the permanent footprint of the Project facilities, as well as the approximate acreage of each LSB soil class within the overall Project area. As shown, the Project facilities would permanently occupy only a fraction of the overall Project area, with less than five percent of the Project area's LSB Class B soils and less than one percent of the Project area's LSB Class D and E soils within the permanent Project footprint. No portion of the Project area has been designated as IAL.

Table 5. Project Acreage by LSB Soil Classification

Area	LSB Soil Class (acres)					Total Area (acres)
	A	B	C	D	E	
Permanent Footprint of Project Facilities[1,2]	0.0	2.04	0.0	0.15	0.003	2.2
Overall Project Area	0.0	47.7	0.0	36.0	13.1	96.8
Percentage of Project Area Occupied by Project Footprint	0.0%	4.3%	0.0%	0.4%	0.02%	2.3%

[1] Additional detail regarding calculation of the permanent project footprint is provided as part of Table 2.

[2] The area occupied by the Project components are calculated based on a 60 percent level of design. These dimensions used for these calculations will be refined through the final design process; in particular, refinements are anticipated based on Hawaiian Electric's technical review and the equipment procurement process. Any refinements are expected to be relatively minor, such that the resulting calculations would not substantively differ from those reported above.

As of 2018, a total of approximately 127,698 acres on O'ahu (or approximately 33 percent of the island) were designated within the State agricultural district (DBEDT, 2019b). A recent USDA census indicates that approximately 71,795 acres on O'ahu are occupied by farmland, with approximately 23,067 acres of crops (USDA, 2019). These data suggest that an extensive amount of land within the agricultural district on the island of O'ahu are fallow or are otherwise not actively used for agricultural purposes. This trend is evident in the general vicinity of the Project area, with a substantial amount of available agricultural land that is currently unused, including areas within the broader UH West O'ahu Mauka Lands property.

Given the lack of infrastructure, insufficient water for irrigation and associated site constraints, and that the Project area would be made available for ongoing compatible agricultural uses, implementation of the Project would not have a significant adverse impact on agricultural production. Rather, it would balance the state's renewable energy and agricultural needs, and would allow for productive, sustainable use of the land. The Project area would comprise less than 10 percent of the overall 991-acre UH West O'ahu Mauka Lands property and would not preclude future agricultural activities from occurring on the remainder of this land. The permanent footprint of the Project facilities would occupy a small fraction of the Project area, with the remaining area available for compatible agricultural uses. Furthermore, at the end of the Project's operational life, the facilities would be decommissioned, and the Project area would be returned to its existing condition (or comparable), thereby maintaining the potential for a full range of future agricultural activities.

6.6 Visual Resources

Short-term visual effects would occur during construction of the Project as a result of construction activities on the site and the presence of equipment and crews. As described in Section 3.3, construction activities associated with the solar and battery storage facilities would include clearing portions of the Project area, grading and stockpiling soil, trenching for installation of electrical wiring and collector lines, excavation for the equipment pads and substation foundation, delivery and installation of the Project components, and installation of service roads and perimeter fencing. These activities would be visible to varying degrees from surrounding locations, including nearby roadways (such as H-1 Freeway, Farrington Highway, Kualakaʻi Parkway, Kunia Road and local streets), as well as from surrounding residential neighborhoods and public spaces. In many areas, intervening structures and vegetation screen views toward the Project area, such that resulting views are either fragmented or blocked; however, unobstructed views occur in some locations. For example, travelers along H-1 Freeway, Farrington Highway and Kualakaʻi Parkway would have unobstructed views within the foreground as they approach the Project area; residents around the perimeter of nearby neighborhoods, particularly those located on the lower slopes of the Waiʻanae Mountains with an elevated viewing position, would also have clear views toward the Project area. Construction activities would be visible from these locations but would be seen in the context of surrounding development including high-voltage transmission lines, Makakilo Quarry and the in-progress rail transit system. Furthermore, visual impacts associated with construction activities would be short-term, as construction equipment and crews would be removed from the Project area once construction is complete.

During the 25-year lifetime of the Project, visual effects associated with operation and maintenance of the Project would result from the visibility of the above-ground Project components, including the solar photovoltaic modules, battery units and associated electrical equipment, substation and interconnection facilities, and perimeter fencing. Based on a viewshed analysis, it is anticipated that views would be primarily from areas southeast, east and northeast of the Project area. Overall, the solar photovoltaic modules are expected to be the most visually prominent component of the Project. The regular geometric forms and strong horizontal and vertical lines associated with the modules would contrast with the organic forms and natural colors of the existing landform and vegetation; in some cases, this effect would be diminished by the geometric shape of nearby agricultural fields. The dark, bluish-gray color of the modules would be set against the dull green and brown hues of the surrounding vegetation; in addition, the color contrast associated with the modules would vary throughout the day as the sun moves across the sky. Although the modules would contrast with elements of the existing landscape, their overall visual effect would vary depending on the extent of visibility, distance of the viewer, and the surrounding context of other existing modifications to the natural landscape. For example, it is anticipated that contrast would be stronger for viewers located within approximately one mile and with unobstructed views of the Project area. Contrast is anticipated to be weaker for viewers that are located at a greater distance (as texture and color become muted and less detailed) and in areas that are screened by topography and/or structures associated with intervening residential and commercial development.

In addition to the contrast added by the solar photovoltaic modules, the substation and interconnection facilities would introduce vertical and geometric structures into the landscape; the substation equipment would generally consist of open metal structures and the interconnection equipment would include three 60-foot-tall wood poles. Similarly, the perimeter fence would add an additional vertical element to the Project area. These features would also contrast with the surrounding natural environment, though they are not likely to be as prominent as the solar arrays and would be smaller than existing transmission lines, streetlight poles, and other structures throughout the region.

As described above, the Project would be visible to varying degrees from surrounding locations; the most prominent views are expected to be from segments of nearby roadways approaching the Project area and from some residences along the perimeter of nearby neighborhoods. Views from the Makakilo neighborhood, located to the southwest, are generally limited to residences located along the northeastern perimeter of the neighborhood who have elevated unobstructed views to the northeast; these views would be partially blocked by intervening topography. From residential areas located to the south and east, views toward the Project area are dominated by the broader Waiʻanae mountain range; the Project area would be located on the lower slopes of the mountains and in many cases would be screened by intervening development and/or vegetation. Where visible, the Project would be seen in the context of other man-made modifications, including residential and commercial structures, high-voltage transmission lines and structures, roadways, Makakilo Quarry and the in-progress rail transit system. Following the 25-year operational period, the Project would be decommissioned, which would include removal of all equipment associated with the Project and returning the Project area to substantially the same condition as existed prior to Project development, as required under HRS § 205-4.5(a)(21).

6.6.1 Important Public Views and Vistas

Important public views and vistas in the Project vicinity are identified in Table 3-2 of the ʻEwa Development Plan; these include views of the Waiʻanae Mountains from H-1 Freeway between Kunia Road and Kaloʻi Gulch and from Kunia Road, and general mauka and makai views (DPP, 2013). General mauka and makai views include those from locations such as public spaces and facilities, including public parks, public institutions, and public transportation facilities such as public roadways, highways, and public transit facilities (e.g., the in-progress Honolulu Rail Transit system). Given the setting of the Project, public spaces, parks and institutions are generally located such that views would be relatively distant and at least partially blocked by intervening topography and structures. The most prominent views of the Project from public facilities would be along roadways and transportation systems proximate to the Project area, including Kualakaʻi Parkway, Farrington Highway and pockets of the H-1 Freeway, as well as the nearby segment of the rail transit system. In all cases, views of the Project would be set amongst a range of man-made modifications (including residential and commercial structures, high-voltage transmission lines and structures, roadways, and Makakilo Quarry), with the Project components located on the lower mountain slopes such that they would not block or otherwise substantially degrade mauka views of the Waiʻanae Mountains.

From the segment of H-1 Freeway between Kunia Road and Kaloʻi Gulch (as identified in the ʻEwa Development Plan), the majority of views toward the Project area are screened by topography and/or vegetation along the edge of the highway. The exception is a short stretch near Kaloʻi Gulch, where there is a break in the vegetation and travelers (eastbound and westbound) would have unobstructed views toward the Project as they pass the Project area. However, these views are expected to be very brief as travelers would only be adjacent to the Project area for a short distance, and their attention would likely be directed toward the road ahead. Furthermore, the viewplanes in this area are dominated by broader landscape views of the Waiʻanae Mountains and Pacific Ocean; the Project would be located on the lower slopes of the Waiʻanae Mountains and would not obstruct broader landscape views due to the low profile of the solar photovoltaic modules.

The segment of Kunia Road identified in the ʻEwa Development Plan has relatively open views toward the Waiʻanae Mountains as the road parallels existing agricultural fields. Northbound travelers would be parallel to the Project at the far southern end of Kunia Road (near the H-1 Freeway interchange), and views would most likely be focused toward the northwest along the full extent of the Waiʻanae mountain range. If northbound travelers were to look directly west, views toward the Project area would be partially screened by intermittent vegetation along the edge of Kunia Road. Furthermore, any visible portions of the Project would be seen at a distance of approximately 2 miles; at this distance, the solar arrays may be distinguishable, but would be muted and less detailed. For southbound travelers, views would similarly be focused toward the Waiʻanae Mountains or south toward the ocean. Although the Project area is within the viewplane, it is partially screened by existing topography and is at a distance of approximately 2 to 3 miles. Furthermore, visible portions of the Project would be seen in the context of other development, including a high-voltage transmission and distribution lines and surrounding commercial development.

Typical views from the segments of H-1 Freeway and Kunia Road identified in the ʻEwa Development Plan are shown on Figure 14 (Attachment A). As shown in these photographs and as described above, views toward the Project area would be at least partially blocked by existing topography, vegetation and intervening structures located along the roadway corridors; views of the broader Waiʻanae Range would not be affected, such that the Project would not be expected to substantially degrade these viewplanes.

6.6.2 Visual Effects at Representative Viewpoints

Based on the results of the viewshed analysis, specific locations for further assessment of potential visibility were identified; these locations are referred to as representative viewpoints. Photographs of the Project area were taken from the representative viewpoints and were used to prepare photographic simulations to illustrate potential views of the Project. Seven representative viewpoints were initially selected for development of panoramic simulations; an additional six single-frame simulations were subsequently developed for viewpoints requested by DPP. The simulations allow for a comparison of the existing landscape and the expected landscape once the Project is constructed. The simulations are presented in Figure 15 (Attachment A); a detailed discussion of the simulation from each representative viewpoint is provided in Section 3.8.2.2 of the Final EA.

As shown in the visual simulations, the Project would be visible to varying degrees from surrounding areas during its 25-year operational period, Areas from which the Project would be most visible include segments of nearby roadways, including H-1 Freeway, Farrington Highway and Kualakaʻi Parkway. Although travelers along these roadways have relatively open views of the Waiʻanae Mountains views as they approach the Project area, views of the Project area are partially obstructed by roadways, rail transit facilities, transmission lines, streetlights and road signs, and vegetation. Features that are visible in the vicinity of the Project area include the former mill building, which is an abandoned structure associated with the historic irrigation and plantation infrastructure within and near the Project area. Once constructed, the geometric form and bluish-gray color of the solar modules would contrast with the surrounding muted green and brown hues of the surrounding vegetation. The scale, form and color of the solar photovoltaic modules would attract viewers' attention, but the contrast would be diminished by the surrounding development and existing man-made features. Given the low profile of the solar arrays relative to the broader context of the Waiʻanae Mountains, the Project would not dominate landscape views nor would it block views of other features in the surrounding landscape, including the former mill building. Although the Project components would introduce an additional visual element, they would be seen in the context of the surrounding development and would not substantially change the overall viewshed. Of all the roadways approaching the Project area, the Project facilities would be most readily visible from the north-bound lanes of Kualakaʻi Parkway, given the orientation of the roadway relative to the Project area. However, in all cases, the visual impacts from these roadways would be short term because travelers would only be approaching the Project area for a limited time and their focus would likely be on the road ahead.

6.6.3 Glare Analysis

In addition to introducing new elements into the visual landscape, the Project also has the potential to produce glare.[21] In general, solar modules are designed to absorb rather than reflect sunlight and incorporate a surface material that allows sunlight to pass with minimal reflection. The modules also have an anti-reflective coating that further reduces reflectivity. Regardless, solar facilities still have the potential to result in some degree of glare.

To evaluate the potential for glare associated with the Project, a glare analysis was conducted using the Solar Glare Hazard Analysis Tool (SGHAT) software through an online tool (GlareGauge) developed by Sandia National Laboratories and hosted by ForgeSolar. A total of three glare analyses were conducted for the Project. The first two analyses included three segmented traffic routes (H-1 Freeway, Farrington

[21] As an industry standard, the term "glint and glare" analysis is typically used to describe an analysis of potential ocular impacts to defined receptors. As a point of clarification, ForgeSolar defines glint and glare in the following statement: "Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration." Based on the ForgeSolar definitions of glint and glare and the stationary nature of the solar photovoltaic modules (fixed tilt), the potential reflectance from the Project is referred to as glare.

Highway, and Kualaka'i Parkway) and three observation points from the surrounding community (to the west, south and east); Analysis 1 represents the point of view from an average first floor residential/ commercial structure and typical commuter car, while Analysis 2 represents the point of view from an average second floor residential/commercial structure and typical semi-tractor-trailer truck. The third analysis included 14 final approach flight paths and two air traffic control towers (ATCTs) associated with Kalaeloa Airport (John Rodgers Field; JRF), Daniel K. Inouye International Airport (Honolulu International; HNL) and Wheeler Army Airfield (HHI). The location of each of these receptors is shown in Figures 16 and 17 (Attachment A).

The results of the analysis indicate that none of the residential/commercial observation points would experience glare as a result of the Project. As summarized in Table 6, Analysis 1 and 2 predicted that a limited amount of green glare (the least severe type of glare) would occur at two segments along Farrington Highway (Farrington-1 and Farrington-2) and at two segments along H-1 Freeway (H1-2 and H1-3) southeast of the Project area. In addition, a very limited amount of yellow glare (85 combined annual minutes) was predicted along one segment of H-1 Freeway (HI-3). In addition, Analysis 3 predicted a limited amount of green glare along three of the final approach paths and the ATCT for Daniel K. Inouye International Airport, located approximately eight miles east of the Project. A detailed discussion of the results is provided in the Glare Analysis Report, contained in Attachment P.

Table 6. Summary of Predicted Glare at Defined Receptors

Receptor[1]	Type of Glare	Annual Minutes[2]	Minutes Per Day	Time of Day	Time of Year
Farrington-1	Green	1,608	Less than 15 min.	6:00 - 7:00 pm	April to May; mid-July to mid-September
Farrington-2	Green	4,840	Less than 15 min.	6:00 - 7:00 pm	April to mid-September
H1-2	Green	118	Less than 15 min.	6:00 - 7:00 pm	April to mid-May; August to mid-September
H1-3	Green	2,624	Less than 15 min.	6:00 - 7:00 pm	April to May; July to mid-September
H1-3	Yellow	50	Less than 5 min.	6:00 - 7:00 pm	Mid-May to mid-July
HNL RWY 22L	Green	847	Less than 10 min.	6:00 - 7:00 pm	Mid-April to May; mid-August to September
HNL RWY 22R	Green	866	Less than 10 min.	6:00 - 7:00 pm	Mid-April to May; mid-August to September
HNL RWY 26L	Green	2,149	Less than 10 min.	6:00 - 7:00 pm	Mid-May to August
HNL ATCT	Green	749	Less than 10 min.	6:00 - 7:00 pm	Mid-May to August

[1] The location of each receptor is shown in Figures 16 and 17.

[2] The annual minutes shown for each roadway segment is based on the results of Analysis 2 (the point of view from an average second floor residential/commercial structure and typical semi-tractor-trailer truck); these results are greater than those for Analysis 1 (the point of view from an average first floor residential/commercial structure and typical commuter car).

It is important to note that the GlareGauge model is conservative in that it does not account for varying ambient conditions (i.e., cloudy days, precipitation), atmospheric attenuation, intervening topography not located within the defined array layouts, or screening by existing or proposed vegetation and structures (including fences or walls). In the case of this Project, Pu'u Kapuai and other topographic

features associated with the Wai‘anae Mountains are located to the west and northwest of the Project and may shade the Project from the sun’s position during the evening hours at certain times of the year. In addition, an existing berm and vegetation is located along portions of the northern side of H-1 Freeway, which would be expected to at least partially screen Project views from vehicular traffic along the modeled segments of H-1 Freeway (see Figure 14; Attachment A); views of portions of the Project from vehicular traffic along the modeled segments of Farrington Highway may also be intermittently screened by vegetation and other existing features.

As summarized in Table 6, occurrences of glare resulting from the Project are expected to be limited; any glare experienced would occur intermittently in the evening hours and would not occur for a period longer than 15 minutes. Furthermore, based on the conservative nature of the model, the results may predict glare at locations where glare will not actually be experienced, such that actual glare conditions are likely to be less than predicted. For these reasons, glare impacts associated with the Project are expected to be minimal. The glare analysis results are further discussed relative to applicable Federal Aviation Administration (FAA) requirements in Section 6.10.2.1.

6.7 Air Quality

Construction of the Project would result in short-term impacts to air quality, primarily as a result of vehicle exhaust emissions and fugitive dust particles from disturbed soils. Vehicle exhaust emissions would be generated by heavy construction equipment operating within the Project area, trucks delivering construction materials and Project components to the site, and vehicles used by construction workers commuting to and from the Project area. These activities would result in emissions of air pollutants including CO_2, nitrogen oxides, sulfur oxides, PM_{10}, and $PM_{2.5}$. In comparison to overall emissions in the region, these contributions are relatively small and would not be expected to affect attainment of the federal or state ambient air quality standards.

State law (HAR § 11-60.1, Air Pollution Control) requires that the best practical operation or treatment be implemented during construction activities such that there is not discharge of visible fugitive dust beyond the property lot line. To comply with these requirements and to minimize any other adverse effects on air quality, the BMPs listed below would be implemented (in addition to those discussed in Section 6.1).

- All construction vehicles and equipment would be properly maintained according to manufacturer’s specifications.
- To the extent feasible, off-road and portable diesel-powered equipment, including but not limited to bulldozers, graders, cranes, loaders, scrapers, backhoes, generator sets, compressors, auxiliary power units, would be fueled with motor vehicle diesel fuel.
- The number of vehicles accessing and moving within the project area would be limited to the extent possible. Vehicles speed on unpaved roads within the Project area would be limited to 25 miles per hour or less.

- Vehicles and equipment would not be allowed to idle for extended periods of time (i.e., more than 20 minutes).
- All trucks hauling soil or other loose materials would be covered.
- Water trucks or sprinkler systems (with no chemical additives) would be used to control fugitive dust within the Project area.
- Carpooling among construction workers would be encouraged to minimize construction-related traffic and associated emissions.

As previously described, areas that have been temporarily disturbed would be revegetated, and the vegetation would be actively monitored and maintained at levels necessary to minimize the potential for erosion and fugitive dust. Operation of the Project would result in minor emissions associated with vehicle exhaust and fugitive dust from vehicles and equipment used to perform operation and maintenance activities, as well as those associated with compatible agricultural activities. None of the equipment associated with the solar arrays, battery units and ancillary facilities (e.g., inverters and control equipment, transformers, switches, etc.) emit air pollutants of any kind. Consequently, it is anticipated that emissions associated with Project operations and maintenance would be very low. At a broader scale, the Project would provide a net air quality benefit by replacing energy generated by burning fossil fuels with renewable energy, thereby reducing emissions of greenhouse gases.

6.8 Noise

As detailed in Section 3.10 of the EA, construction of the Project would generate noise that exceeds the ambient levels and has the potential to cause a temporary and short-term disturbance to noise sensitive receptors. Reasonable efforts would be made to minimize the noise levels associated with Project construction to the extent practicable, including measures such as those listed below. If necessary, a noise permit would be obtained during construction to allow for exceedances of the maximum permissible sound levels.

- Construction activities would not occur between 7:00 pm and 7:00 am on weekdays or Saturday, or at any time on Sunday within 500 feet of an occupied residence.
- Construction site and access road speed limits would be established and enforced during the construction period.
- Electrically-powered equipment will be used instead of pneumatic or internal combustion powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas would be located as far as practicable from noise-sensitive receptors.
- The use of noise-producing signals, including horns, whistles, alarms, and bells would be for safety warning purposes only.

- No Project-related public address or music system would be audible at any adjacent receptor.
- All noise-producing construction equipment and vehicles using internal combustion engines would be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) will be equipped with shrouds and noise control features that are readily available for that type of equipment.

During operations, the principal sources of noise associated with the Project would be the electrical components of the inverters, the step-up transformer within the substation, and cooling-ventilation fans associated with transformers and battery storage. The solar modules would not be within 100 feet of the property line, nor would they be expected to generate low-level sound beyond the Project area. The solar array inverters and transformers are generally considered a low-level source of noise, limited to daytime hours when the solar arrays are generating electricity. After sunset, when the modules no longer receive solar radiation, the inverters would not produce noise; the transformers would be energized but likely operating under low noise condition using natural draft cooling (i.e., fans would not be running due to lower nighttime heat loads). Operational noise associated with the Project is not expected to significantly impact any noise sensitive receptors, especially in the context of the industrial and agricultural activities in the Project vicinity. Any operational noise associated with the Project is expected to be below the maximum permissible sound levels.

6.9 Hazardous Materials

A Phase I Environmental Site Assessment was conducted for the Project area in March 2019. The results of this effort indicated that no hazardous materials are known to be present within the Project area. It was noted that based on the historical use of the property as part of a sugar cane and pineapple plantation, environmentally persistent agricultural chemicals may have been applied and thus may be present in surface and shallow subsurface soils at the site. It was also noted that the concrete irrigation flume located in the central portion of the property includes caulking, which could possibly contain asbestos. In the event the concrete irrigation flume is removed from the Project area, the caulking would be sampled to determine whether asbestos-containing material is present prior to removal. If asbestos is present, the Asbestos Abatement Office in the DOH Indoor and Radiological Health Branch would be contacted and the appropriate abatement protocols would be implemented in accordance with applicable regulations.

No extremely hazardous materials as defined by 40 CFR 355 (*List of Extremely Hazardous Substances and Their Threshold Planning Quantities*) would be produced, used, stored, transported, or disposed as part of the Project. Construction and operations activities would require the use of some hazardous materials, such as fuels (e.g., gasoline and diesel fuel) and lubricants, which could adversely affect the environment if accidentally released. However, only a limited amount of these materials would be present onsite and BMPs would be implemented to avoid and minimize potential impacts; BMPs would

include proper storage procedures (including secondary containment), routine inspection of vehicles and equipment for leaks, fueling and vehicle maintenance in offsite facilities or designated areas with secondary containment (with use of spill pads), and proper waste collection and disposal methods.

During the operational phase of the Project, oil-based products would be stored within the Project area, as the transformers use oil for insulation and cooling. Transformer oil is typically mineral oil or seed oil that is considered nontoxic and a non-hazardous substance; it does not contain polychlorinated biphenyls or compounds listed as extremely hazardous under 40 CFR 355. Transformers at the substation would be ground-mounted units constructed on concrete pads with secondary spill containment traps designed to minimize the possibility of accidental leakage. Furthermore, a Spill Prevention Control and Countermeasure (SPCC) Plan would be prepared, in accordance with the requirements of 40 CFR 112 (*Oil Pollution Prevention*). The plan would identify all oil storage containers, secondary containment and oil spill controls, inspection and testing protocols, training procedures, security measures, emergency response and notification procedures, key Project and regulatory contacts, and reporting requirements. Given the relatively small quantities and nature of the oil-based products, combined with secondary containment and other procedures that would be established as part of the SPCC Plan, the potential for oil-related spills and the associated effects are expected to be minimal.

As described in Section 3.1.2, the Project would include a battery energy storage system with a total of ten 1,300-kilowatt lithium-ion battery units. Each battery unit would incorporate multiple layers of protection to avoid failures and to contain potential hazardous substances. Specific features would include integrated monitoring and circuit protection, a self-contained heating ventilation air cooling system, and a fire detection and clean agent suppression system specifically designed for lithium-ion battery energy storage systems. Specific safety controls would include:

- Batteries would be stored in completely contained, leak-proof containers;
- Temperature/smoke/fire sensors, alarms, and aerosol fire extinguishing systems would be installed in every battery container;
- Each battery container would be controlled by remote power disconnect switches; and
- Battery system would undergo qualification testing prior to commercial operation.

In the event a lithium-ion battery requires replacement, the battery system would be disconnected and de-energized to allow for battery removal and replacement; the old battery would be properly packaged and transported to an approved recycling facility. All stages of this process would be conducted in accordance with all relevant regulatory requirements in place at the time of replacement. In particular, transportation of the lithium-ion batteries would be conducted in accordance with U.S. Department of Transportation Pipeline and Hazardous Material Administration regulations, including 49 CFR 173.185 (*Lithium Cells and Batteries*). This regulation includes requirements related to testing, proper packaging (such that the batteries are completely enclosed and are separated from contact from other equipment, devices, or conductive materials), and safety measures (including those related to preventing rupture, external short circuits, and reverse current flow).

As part of the decommissioning process, removal and treatment of the battery system would be conducted in the same manner as described above for battery replacement during the operational phase. Adherence to the applicable regulatory requirements would minimize potential hazards related to use, handling, transport, and disposal of batteries throughout Project operations and decommissioning.

6.10 Transportation and Traffic

6.10.1 Roadways

The Project is not expected to involve construction or improvements within any state or county roadway. However, the roadway network would be used by construction workers and for equipment deliveries to the Project area. During construction, the anticipated number of workers expected to be at the Project site each day ranges from 10 to 160 workers, with a daily average of approximately 55 workers over the course of the construction phase. An estimated 500 tractor trailer loads would make deliveries to the Project site over the course of the construction phase.

Based on the results of the TIAR (see Attachment Q), Project construction is not expected to measurably affect the overall level of service at the signalized intersections adjacent to the Project area. However, recognizing that construction could result in minor, localized impacts to traffic and the roadway network, a TMP would be prepared prior to construction. The TMP would describe the potential impacts to the surrounding roadway network and would detail the measures that would be implemented to avoid, minimize and mitigate potential impacts based on Complete Streets principles; it is expected that the measures would include those listed below. The TMP would be submitted to the Hawai‘i Department of Transportation (DOT), the City and County of Honolulu Department of Transportation Services, and DPP for review and approval prior to construction.

- Delivery of construction materials and equipment using oversized trucks would occur during off-peak traffic hours. Other deliveries of construction materials and equipment would be timed to occur during off-peak traffic hours to the extent practicable.
- If any construction projects are planned to occur on nearby properties during the same time frame, the timing of deliveries would be coordinated to minimize traffic-related impacts.
- Notification regarding the status of Project construction and potential traffic impacts would be provided to area representatives, the neighborhood board, area residents and businesses, emergency personnel (fire, ambulance, and police), and public transit services (TheBus and TheHandi-Van), as appropriate.
- If Project vehicles result in damage to an existing roadway or sidewalk, the roadway or sidewalk will be promptly repaired in accordance with current design standards and Americans with Disabilities Act requirements.
- Existing pedestrian, bicycle and vehicle access/crossings shall be maintained with the highest safety measures during construction. If it is determined that roadway, sidewalk or crosswalk

closures are necessary, alternate routes would be provided for vehicles, pedestrians, and bicyclists that are safe and clearly marked.

Once operational, it is anticipated that the Project would have 1-2 employees regularly visiting the site for operations activities. As such, Project operations would not be expected to measurably impact traffic on roads surrounding the Project area.

6.10.2Airports

The nearest airport to the Project area is Kalaeloa Airport (JRF), approximately 3.6 miles to the south. The Daniel K. Inouye International Airport (HNL), the state's largest airport, is located approximately 8 miles southeast of the Project area (DOT, 2019).

FAA requires that land uses adjacent to or in the immediate vicinity of an airport be compatible with normal airport operations, including land and takeoff of aircraft (FAA Order 5190.6B). In response to this mandate, the State of Hawai'i Office of Planning issued a Technical Assistance Memorandum (TAM-2016-1) to provide guidance for development and activities that may pose potential hazards including attraction of hazardous wildlife, glint/glare hazard or an aerial obstruction hazard. This guidance identifies solar photovoltaic panels as one of the many land use practices that may present a hazard to existing flight paths; specific concerns related to solar photovoltaic facilities are identified as:

- Potential glare and glint caused by parabolic troughs and heliostats that might cause temporary loss of vision to pilots on arrival or departure, or to Air Traffic Control personnel in the control tower;
- Electromagnetic interference with on-and off-airport radar systems that may pick up a false signal from the metal components of the mirrors with impacts that can vary based on solar tracking activity;
- Physical penetrations of navigable airspace from power towers that extend into Part 77 imaginary surfaces, terminal instrument procedures (TERPS) surfaces, or the path of radio emitting navigational aids; and
- Thermal plumes emitted by the power tower that produce unexpected upward moving air columns into navigable air space.

The Project would not include parabolic troughs, heliostats, mirrors or power towers, such that none of the identified concerns would occur as a result of the Project. However, TAM-2016-1 recommends filing Form 7460-1 with the FAA pursuant to CFR Title 14 Part 77.9 if the Project is within 3 nautical miles of an airport or has a footprint approaching 1 acre.

6.10.2.1 Glare

According to 78 FR 63276, the FAA has determined that "glint and glare from solar energy systems could result in an ocular impact to pilots and/or air traffic control facilities and compromise the safety of the air transportation system." The FAA Notice Criteria Tool (NCT) reports whether a proposed structure is in proximity to a jurisdictional air navigation facility and if formal submission to the FAA Obstruction

Evaluation Group (OEG) under CFR Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace) is recommended. The NCT also identifies final approach flight paths that may be considered vulnerable to a proposed structure's impact on navigation signal reception. The NCT was utilized to determine if the Project is located within an FAA-identified impact area based on the Project boundaries and height above ground surface. The FAA NCT Report stated that a formal filing with the FAA OEG is recommended, and referenced Kalaeloa Airport (JRF), Daniel K. Inouye International Airport (Honolulu International, HNL), and Wheeler Army Airfield (HHI). Based on this information, these three airport facilities were included in the SGHAT analysis conducted for the Project.

As described in Section 6.6.3, the SGHAT analysis included 14 final approach flight paths and two ATCTs associated with Kalaeloa Airport, Daniel K. Inouye International Airport and Wheeler Army Airfield. The results of the analysis indicate that no glare would be experienced at Kalaeloa Airport or Wheeler Army Airfield. A limited amount of green glare was predicted for three of the final approach paths and the ATCT for Daniel K. Inouye International Airport; these results are summarized in Table 6, with additional detail provided in the Glare Analysis Report (Attachment P). As the Daniel K. Inouye International Airport is located approximately 8 miles from the Project area and the potential occurrence of glare is extremely limited (less than 10 minutes per day during certain months of the year), the Project is not expected to significantly impact airport facilities as a result of glare.

As recommended by the NCT, the Project was formally filed with the FAA OEG to confirm these conclusions; on June 9, 2020, FAA OEG issued a determination of No Hazard to Air Navigation for the Project (see Attachment P). Once the Project is operational, in the unlikely event that it is determined that the Project is creating a hazardous condition for pilots, AES would immediately mitigate the hazard upon notification by FAA and/or DOT Airports Division.

6.10.2.2 Radio Frequency Interference

Solar photovoltaic systems have also been known to emit radio frequency interference to aviation-dedicated radio signals, disrupting the reliability of air-to-ground communications. The Federal Communications Commission (FCC) regulates radio frequency (RF) devices contained in electronic-electrical products that are capable of emitting radio frequency energy by radiation, conduction, or other means. These products have the potential to cause interference to radio services operating in the radio frequency range of 9 kHz to 3000 GHz. All RF devices used for the Project would comply with FCC regulations and would operate only in designed frequency bands. No interference with aviation communication frequency is expected. In the unlikely event of an unexpected radio frequency interference situation and notification by either FAA or DOT Airports Division, the Project's wireless communication system would be disabled and investigated to ensure it does not create a hazardous condition.

6.11 Natural Hazards

Natural hazards that can affect O'ahu include flooding, tsunami inundation, and wildfire. As previously described in Section 4.3, the Project area is not located within a flood hazard zone or a tsunami

evacuation zone; therefore, it is extremely unlikely that conditions associated with flood or tsunami inundation would occur within the site, nor would the Project contribute to increased risk of flooding or inundation.

Wildfires in Hawai'i are predominantly caused by human activity, with most fires originating near roadways; other contributing factors include the prevalence of non-native vegetation and climate change. To avoid and minimize the potential for wildfire as a result of Project implementation, as well as the spread of wildfire from surrounding areas, the Project would incorporate multiple layers of fire prevention and suppression measures. It is being designed in accordance with the National Fire Protection Association (NFPA) 1 and National Electric Code (NEC) requirements for fire prevention for large-scale solar facilities, including installation of fire breaks throughout the Project area. Vegetation within the Project area would be managed with livestock to control combustible materials, while still providing enough ground cover to prevent erosion. Dedicated operations and maintenance staff would proactively monitor the vegetation growth. All electrical wiring would be elevated or enclosed, thus preventing interaction between circuits and flammable materials. Battery systems would be fully contained within temperature-controlled, leak-proof containers; each container would be fully equipped with temperature/smoke/fire sensors and alarms, remote controlled disconnects and a clean agent fire suppression system. Remote monitoring staff would be alerted in the event of a system issue. As previously discussed, the access and service roads used for the Project would provide the required clearance and turning radius needed for emergency response vehicles, in accordance with the fire code. The Honolulu Fire Department was initially consulted as part of the pre-assessment scoping process and consultation will continue throughout the design of the Project, with on-site training and orientation prior to commercial operation.

6.12 Public Facilities and Services

6.12.1 Police, Medical and Fire Protection Services

Consistent with requirements articulated by the Honolulu Fire Department, the existing access roads as well as service roads within the Project area would be able to accommodate fire apparatus and would meet the relevant specifications identified in the fire code; it is anticipated that the Project does not need to provide water supply for fire flow as no occupied buildings would be constructed within the Project area. Furthermore, as discussed above, the Project would incorporate multiple layers of fire prevention and suppression measures. As previously noted, the Honolulu Fire Department has been and will continued to be consulted throughout the Project development process, with on-site training and orientation prior to commercial operation. The design drawings for the Project will also be submitted to DPP for review and approval prior to construction. As such, the Project is not expected to increase the need for fire response or otherwise impact fire protection services; no mitigation is proposed.

Similarly, the Project is not expected to interrupt, increase the demand for, or otherwise affect police or emergency medical services. During construction, the Project area would be staffed with security personnel on an as-needed basis to protect equipment and machinery used to construct the Project.

This would be in addition to the 24-hour security that controls entry to the UH West O'ahu Mauka Lands property. During operations, the facilities would be adequately secured and are not expected to require additional security on a regular basis. A surveillance system at key areas (such as the substation and PCS pads) would be incorporated and additional security measures (such as fence-top deterrents) would be added if the need arises. As such, the Project is not expected to impact police services.

6.12.2 Educational Facilities

The Project would not impact existing educational facilities, nor would it increase the need for educational facilities. Although located on the UH West Oʻahu Mauka Lands property, the Project would not impact the campus; furthermore, the Project would be consistent with their long-range land use plan for UH West Oʻahu. As such, no mitigation is proposed.

6.12.3 Recreational Facilities

There are no existing recreational areas within or immediately surrounding the Project area. As such, the Project would not affect existing recreational facilities and no mitigation is proposed.

6.13 Economic Resources

Overall, Project implementation would positively contribute to Hawaiʻi's economy by providing jobs and other forms of economic activity. Jobs directly related to construction and operation of the solar facilities would be considered "green jobs," which are generally defined as jobs related to preserving or restoring the environment (U.S. Bureau of Labor Statistics, 2020). The economic activity associated with the Project was modeled using IMPLAN, a commercially available economic modeling package widely used to assess the economic impacts of renewable energy and many other types of projects. Economic impacts were assessed in terms of employment, labor income, and economic output, with separate analyses presented for the construction and operation phases. The results of the analysis are summarized below; additional details are provided in the EA.

It is estimated that construction of the Project would directly employ an average of 55 onsite workers, including technicians, laborers, foremen, equipment operators, and construction managers for the solar photovoltaic modules, battery energy storage system and other renewable energy equipment. AES is deeply committed to promoting local job opportunities in Hawaiʻi. It is anticipated that approximately 75 percent of these positions (or a total of approximately 41 jobs) would be filled by Hawaiʻi residents and would result in an estimated $6.6 million in related payroll (labor income). The remaining jobs are expected to require specialty trade and/or professional staff that would be brought to Hawaiʻi for the Project; in many cases, these staff would serve to train the local workforce and commission certain components per manufacturer requirements. Construction of the Project would also support employment, labor income, and economic output in other sectors of the state economy, with indirect impacts estimated to support approximately 38 jobs and induced impacts estimated to support a further 38 jobs.[22] It is estimated that

[22] Indirect impacts relate to workers directly employed elsewhere in Hawaiʻi that would provide Project-related technical services, such as engineering design and permitting, and expenditures on goods and services by those

construction of the Project would support a total of 118 jobs in the state of Hawai‘i and approximately $11.3 million in labor income, with total economic output of approximately $20.2 million.

Once operational, the Project would continue to contribute to the state economy over its 25-year lifespan. AES expects to employ an in-state workforce of 5 employees to oversee operations and maintenance of their Hawai‘i portfolio, including the Project. Operation and maintenance of the Project would also support employment, labor income, and economic output in other sectors of the state economy. It is estimated that the Project would support approximately 7.6 total (direct, indirect, and induced) jobs in Hawai‘i and approximately $0.7 million in labor income, with total economic output of approximately $1.2 million. Estimated indirect and induced impact estimates include the impacts of Project-related payments to UH, which would potentially support employment at the university, as well as elsewhere in the statewide economy. In addition, the Project will support additional economic benefits associated with the compatible agricultural activities. These estimated annual impacts would be expected to occur each year that the Project operates.

As part of decommissioning, the Project would directly employ workers from Hawai‘i, as well as support additional secondary (indirect and induced) benefits elsewhere in the regional economy. In-state expenditures on equipment and material recycling/salvage and disposal, and per diem expenditures by workers on lodging and food, as well as spending on household goods and services by workers living in the area would all support additional economic activity elsewhere in the state economy. Economic impacts related to decommissioning are expected to be broadly similar to those anticipated during construction.

suppliers. Induced impacts are generated by household spending associated either directly or indirectly with the proposed facility (e.g., use of income to purchase groceries and other household goods and services).

7 Land Use Commission Guidelines

The State Land Use Commission has adopted guidelines for determining an "unusual and reasonable use" under HAR § 15-15-95(b). These guidelines are bulleted in bold below, followed by a discussion of how the Project meets each guideline.

(1) The use shall not be contrary to the objectives sought to be accomplished by chapters 205 and 205A, HRS, and the rules of the commission;

The Hawai'i State Land Use Law (HRS § 205) established the State Land Use Commission and granted the authority to classify all lands in the state into one of four land use districts: urban, rural, agricultural, and conservation. The Project is located entirely on land that is classified within the agricultural district. HRS § 205 specifies the uses that are permitted within the State agricultural district, with consideration given to the LSB classification system.

HRS § 205-2(d) specifies that the agricultural district shall include:

> *(6) Solar energy facilities; provided that:*
>
> *(A) This paragraph shall apply only to land with soil classified by the land study bureau's detailed land classification as overall (master) productivity rating class B, C, D, or E; and*
>
> *(B) Solar energy facilities placed within land with soil classified as overall productivity rating class B or C shall not occupy more than ten per cent of the acreage of the parcel, or twenty acres of land, whichever is lesser, unless a special use permit is granted pursuant to section 205-6;*

HRS § 205-4.5(a) further restricts uses for solar energy facilities on Class B or C soils to include the following:

> *(21) Solar energy facilities on lands with soil classified by the land study bureau's detailed land classification as overall (master) productivity rating B or C for which a special use permit is granted pursuant to section 205-6; provided that:*
>
> *(A) The area occupied by the solar energy facilities is also made available for compatible agricultural activities at a lease rate that is at least fifty per cent below the fair market rent for comparable properties;*
>
> *(B) Proof of financial security to decommission the facility is provided to the satisfaction of the appropriate county planning commission prior to date of commencement of commercial generation; and*
>
> *(C) Solar energy facilities shall be decommissioned at the owner's expense according to the following requirements:*
>
> *(i) Removal of all equipment related to the solar energy facility within twelve months of the conclusion of operation or useful life; and*

(ii) Restoration of the disturbed earth to substantially the same physical condition as existed prior to the development of the solar energy facility.

As shown in Figures 5 and 10 (Attachment A), the Project area is entirely within the State agricultural district and is designated as having LSB Class B, D, and E soils. As listed in Table 5, the Project area includes approximately 48 acres of Class B soils, approximately 36 acres of Class D soils, and approximately 13 acres of Class E soils. The Project would not involve construction of any facilities on land designated as having LSB Class A soils.

Pursuant to HRS § 205-4.5(a)(21), the Project would be a permitted use with issuance of a Special Use Permit. This document has been prepared as part of the application for a Special Use Permit; as described throughout this document, the Project would comply with the provisions of HRS § 205-4.5(a)(21) as follows:

- **Compatible agricultural activities:** Along with the solar and storage facilities, the Project area would be made available for compatible agricultural activities at a lease rate at least 50 percent below fair market rent. Based on an assessment of agricultural activities that could be conducted in parallel with the solar energy facilities in the Project area, the most promising options include honey production and/or cattle grazing and production. These activities are compatible with solar energy production, well-suited to the site-specific conditions, and require minimal water resources. As described further in Section 3.2.2, facilities and equipment to support the agricultural activities, such as beekeeping stations, cattle trap areas and water troughs, would be installed as part of the Project. In the event that the agricultural activities outlined above are determined to not be viable or an agriculture partner ceases operations or an interest in partnering, AES would seek other potential partners for similar agricultural activities and would continue to make the Project area available at a lease rate that is at least fifty percent below fair market rent for comparable properties.
- **Decommissioning:** Based on the approved PPA, the Project is expected to have an operational life of approximately 25 years. At that point in time, the facility may be re-powered under a re-negotiated PPA (with subsequent permits/approvals) or decommissioned. Decommissioning would involve removal of all equipment associated with the Project within 12 months of ceasing operations, and returning the Project area to substantially the same physical condition as existed prior to Project development. A detailed discussion of decommissioning is provided in Section 3.5, with the decommissioning plan included as Attachment L.
- **Proof of Financial Security:** In accordance with the requirements of HRS § 205-4.5(a)(21), financial assurance for decommissioning would be provided to the City and County of Honolulu Planning Commission prior to the commencement of commercial generation. The financial security would be in the form of a parent guaranty or letter of credit, with the security to remain in place for the duration of the Project.

As further discussed in Section 10, no portion of the Project area has been designated or identified as IAL and therefore the Project would comply with HRS § 205 (Part III). The Project would also comply with the objectives and policies of HRS § 205A, as further discussed in Section 8.1.

(2) The proposed use would not adversely affect surrounding property;

The Project area is located in the ʻEwa District, approximately 3 miles northeast of Kapolei. Based on its designation in the City and County of Honolulu's General Plan and ʻEwa Development Plan as the island's secondary urban center, much of the growth on Oʻahu has been focused in this region. Large scale development of the City of Kapolei started in the 1990s, and has included a wide range of commercial, residential, industrial and government facilities.

The Project would be located within the southwestern portion of the 991-acre UH West Oʻahu Mauka Lands property, which was historically part of an extensive agricultural plantation, but has been fallow and intermittently used for cattle grazing since the 1990s. The lands immediately surrounding the Project area, which are also part of the UH West Oʻahu Mauka Lands property, would continue to be used for cattle grazing and would not be affected by construction or operation of the solar and storage facilities. Other surrounding uses beyond the adjacent lands include the former Honouliuli Internment Camp site (approximately 1 mile to the northeast) and Makakilo Quarry (approximately 0.6 mile to the southwest); the residential community of Makakilo is located just north of the quarry, with the closest residential structure approximately 0.3 mile from the Project area. As discussed in Section 6.6, the Project would be visible to varying degrees from surrounding areas; however, it would not obstruct or impede views of the Waiʻanae Mountains, Pacific Ocean or other scenic resources. The Project facilities would introduce new visual elements within the landscape, but these would be seen in the context of other development including high-voltage transmission lines, commercial and residential structures, the rail transit system, Makakilo Quarry and other man-made features.

Construction of the solar and storage facilities would involve a variety of ground disturbing activities, such as site preparation and grading, equipment installation (e.g., driving support posts), and trenching for the underground collection lines. Use of heavy equipment and earthmoving operations conducted as part of these activities would generate noise, as well as temporary fugitive dust and internal combustion engine emissions, resulting in temporary and localized impacts to air quality. BMPs would be implemented to minimize the noise and emission levels, and in general, the impacts are expected to be temporary, intermittent, and localized in nature. Similarly, construction and operation of the Project would require a variety of truck deliveries and other vehicle trips; however, these are not expected to measurably affect traffic levels; in addition, BMPs would be implemented to avoid, minimize and mitigate potential impacts based on Complete Streets principles. Overall, none of these impacts would be expected to alter the character of the surrounding areas in a manner that would result in significant adverse effects.

(3) The proposed use would not unreasonably burden public agencies to provide roads and streets, sewers, water drainage and school improvements, and police and fire protection;

As noted above, Project traffic is not expected to measurably affect local roads and streets, nor would it require any school improvements. No connection to the domestic water or sanitation system would be required. Overall, the Project would not require improvements or otherwise burden public infrastructure.

The Project would incorporate multiple layers of fire prevention and suppression measures, and no occupied buildings would be constructed within the Project Area. As such, the Project is not expected to unreasonably burden fire protection services. During construction, the Project area would be staffed with security personnel on an as-needed basis. During operations, the facilities would be adequately secured and are not expected to require additional security on a regular basis. Therefore, the Project is also not expected to unreasonably burden police services.

(4) Unusual conditions, trends, and needs have arisen since the district boundaries and rules were established; and

As discussed in Section 1.1, the State of Hawai‘i has established an RPS, as codified in HRS § 269-92, which specifies that electric utility companies in Hawai‘i must use renewable energy for the equivalent of 30 percent of net electricity sales by 2020, 40 percent by 2030, seventy percent by 2040, and 100 percent by 2045. As of the third quarter of 2019, approximately 25 percent of Hawaiian Electric’s electrical energy sales on O‘ahu were generated by renewable energy sources (Hawaiian Electric, 2019b).

The Project area is well suited for solar energy generation as it includes undeveloped land with relatively flat to moderate slopes that can accommodate the solar modules and battery storage facilities, existing access roads that can be traversed by construction equipment, and the ability to interconnect with the existing Hawaiian Electric grid onsite. The Project would help to meet the state’s need for renewable energy by providing up to 12.5 MW of solar energy and 50 MWh of battery storage, which is enough to provide electricity for approximately 4,600 homes (based on average energy use). In doing so, it would directly contribute to the state’s renewable energy goals, fulfilling approximately 0.5 percent of Hawaiian Electric’s RPS (Hawaiian Electric, 2019b).

It is recognized that these site attributes are also valuable for agricultural purposes, and it is understood that there is a need to balance agricultural and renewable energy production. By making the Project area available for compatible agricultural activities at a lease rate below fair market rent, the Project seeks to balance these uses.

(5) The land upon which the proposed use is sought is unsuited for the uses permitted within the district.

As discussed in Section 3.2, agricultural activities in the Project area are highly constrained by site-specific factors, particularly the lack of infrastructure and insufficient water for irrigation. However, the Project area would be used in a manner that balances both agriculture and renewable energy needs. The Project is consistent with the underlying objectives of HRS § 205, in that it would support and subsidize compatible agricultural activities (such as honey production and cattle grazing) and would implement decommissioning provisions in which the land would be returned to substantially the same condition as existed prior to Project development, thus allowing for the full range of future agricultural uses.

8 Consistency with State and County Plans and Programs

The application for a Special Use Permit requires that the project demonstrate consistency with the State's Coastal Zone Management policies and objective (HRS § 205A) and the Hawai'i State Plan (HRS § 226), as well as the City and County's General Plan and the applicable Development Plan or Sustainable Communities Plan. Consistency with these plans and programs is summarized below.

8.1 Coastal Zone Management Program (HRS § 205A)

Under the authority of the federal Coastal Zone Management Act (16 U.S.C. 1451-1456), the Hawai'i Coastal Zone Management (CZM) Program was enacted as HRS § 205A and is administered by the Hawai'i Department of Business, Economic Development and Tourism (DBEDT) Office of Planning. The purpose of the Hawai'i CZM program is to provide for the effective management, beneficial use, protection, and development of the coastal zone. It is designed to integrate decisions made by state and county agencies to provide greater coordination and compliance with existing laws and rules. The CZM area encompasses the entire state. The objectives of the Hawai'i CZM Program are listed in Table 7, with a brief statement regarding the consistency of the Project with each of the objectives and associated policies.

Table 7. Project Consistency with the Objective and Policies of the Hawai'i CZM Program

Objectives and Policies	Assessment of Consistency
Recreational Resources: Provide coastal recreational opportunities accessible to the public.	The Project area does not support coastal nor any other type of recreational resources; the nearest coastal recreational areas are approximately 4 miles west and 5 miles south of the Project area. The Project would not impair access to the shoreline, degrade the quality of coastal waters, or otherwise affect coastal recreational opportunities.
Historic Resources: Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.	An AIS was conducted for the Project, including detailed background research and a 100 percent pedestrian inspection of the Project area. The AIS identified two historic properties within the Project area, consisting of irrigation and plantation infrastructure and a remnant portion of the Waiahole Ditch. The Draft AIS Report was submitted and is pending SHPD review in compliance with HRS § 6E and HAR § 13-284. Implementation of the Project would affect portions of these historic properties within the Project area; the portions that are not affected by the proposed improvements would be kept intact. Based on the conclusions regarding significance and documentation to date, pursuant to HAR § 13-284-7 and subject to review and concurrence by SHPD, the effect determination for the Project is "no historic properties affected" with a recommendation for no further historic preservation work. AES intends to obtain SHPD's review of the AIS and concurrence with the effect determination prior to the Planning Commission hearing for the Special Use Permit application.
Scenic and Open Space Resources: Protect, preserve, and where desirable,	Within the Project area, the solar photovoltaic and storage facilities would have a very small permanent footprint; the surrounding portions of the Project area would be maintained as open space. The Project would be visible to varying

Objectives and Policies	Assessment of Consistency
restore or improve the quality of coastal scenic and open space resources.	degrees from surrounding areas; however, it would not obstruct or impede views of the Wai‘anae Mountains, Pacific Ocean or other scenic resources. The Project facilities would introduce new visual elements within the landscape, but these would be seen in the context of other development including high-voltage transmission lines, commercial and residential structures, the rail transit system, Makakilo Quarry and other man-made features.
Coastal Ecosystems: Protect valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems.	The Project would be located inland and would not involve work within or near coastal ecosystems. Ground disturbance during construction could temporarily increase the amount of sediment and other pollutants in stormwater runoff, which could affect water quality in receiving waters. However, BMPs would be implemented such that no adverse impacts to coastal ecosystems are anticipated.
Economic Uses: Provide public or private facilities and improvements important to the State’s economy in suitable locations.	The Project is not a coastal-dependent development. It would involve construction and operation of a solar energy generation facility in an inland location, within the State agricultural land use district. Based on the soil classification (LSB Class B, D and E), the Project is permitted within the State agricultural land use district use with issuance of an Special Use Permit, assuming compliance with the provisions related to decommissioning, proof of financial security, and making the Project area available for compatible agricultural activities at a lease rate below fair market rent. Activities that would be conducted pursuant to these requirements are described in Section 7.
Coastal Hazards: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.	The Project area is not within a tsunami or floodplain zone and is not subject to coastal hazards. The Project would be designed and constructed in compliance with all applicable Federal, State, and local environmental protection, design, and building standards and regulations, including the Federal Flood Insurance Program, and would not contribute to coastal flooding.
Managing Development: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.	Outreach and consultation was initiated with Project stakeholders early in the Project development process. In parallel, an EA was prepared to disclose the potential impacts of the Project; the environmental review process included opportunities for public review and comment, pursuant to HRS § 343 and HAR § 11-200.1. The discretionary permitting process will also include opportunities for public participation.
Public Participation: Stimulate public awareness, education, and participation in coastal management.	The Project does not contain a public participation component for programmatic coastal management issues. Project-specific input has and will continue to be sought through the permitting and Project development process.
Beach Protection: Protect beaches for public use and recreation.	The Project would be located inland and would not involve placement of any structures within the shoreline setback area or otherwise affect erosion or natural shoreline processes.
Marine Resources: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.	The Project would not be located near the shoreline and would not directly or indirectly affect any marine resources.

Key components of the Hawai‘i CZM Program include (1) regulation of development within the SMA, a designated area extending inland from the shoreline, (2) restrictions within the shoreline setback area, which serves as a buffer against coastal hazards and erosion and to protect viewplanes, and (3) a Federal Consistency provision, which requires that federal activities, permits, and financial assistance be consistent with the enforceable policies of the Hawai‘i CZM program, to the maximum extent

practicable. The Project area is not within either the SMA or the shoreline setback area, nor would it involve a federal activity or permit requiring federal consistency review.

8.2 Hawai‘i State Planning Act (HRS § 226)

The Hawai‘i State Planning Act (HRS § 226) is a broad policy document relating to the statewide planning system, including all activities, programs and decisions made by local and state agencies. It is intended to “improve the planning process in this state, to increase the effectiveness of government and private actions, to improve coordination among different agencies and levels of government, to provide for wise use of Hawai‘i’s resources and to guide the future development of the state” (HRS § 226-1). The State Plan serves as written guide for the long-range development of the state by describing the desired future for the residents of Hawai‘i and providing a set of goals, objectives, and policies that are intended to shape the general direction of public and private development. Part I of the State Plan lists the state’s long-range goals, objectives, policies and priorities. Part II establishes a statewide planning system to coordinate and implement the State Plan. Part III establishes priority guidelines to address areas of statewide concern.

The stated goals of the state plan relate to a strong viable economy, a desired physical environment, and individual and family well-being (HRS § 226-4). Overall, the Project supports these goals; in particular, it would serve to provide a clean source of renewable energy that reduces the use of fossil fuels to meet the state’s energy needs, while providing environmental and human health benefits. Consistency of the Project with the specific objectives and policies in the Hawai‘i State Plan is summarized in Table 8. Consistency of the Project with the specific relevant priority guidelines in the Hawai‘i State Plan is summarized in Table 9. Relevant state functional plans are discussed in the following subsection.

Table 8. Project Consistency with the Objective and Policies of the Hawai‘i State Planning Act

Objectives	Assessment of Consistency
Population: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.	The Project would not have any effect on population growth.
Economy - In General: Planning for the State's economy in general shall be directed toward achievement of the following objectives: (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i’s people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited. (2) A steadily growing and diversified economic base that is not overly dependent on a few industries and includes the development and expansion of industries on the neighbor islands.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (7) Expand existing markets and penetrate new markets for Hawai‘i's products and services. (12) Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawai‘i. The Project would contribute to Hawai‘i’s growing renewable energy market and would provide employment opportunities for Hawai‘i residents in the innovative renewable energy field, particularly during construction; although operations would not include many labor-intensive activities, the Project would positively contribute to Hawai‘i’s economy.

Objectives	Assessment of Consistency
Economy – Agriculture: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives: (1) Viability of Hawai'i's sugar and pineapple industries. (2) Growth and development of diversified agriculture throughout the State. (3) An agriculture industry that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (2) Encourage agriculture by making the best use of natural resources. (12) In addition to the State's priority on food, expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises. The Project would seek to balance agricultural and renewable energy needs. Specifically, it would support and subsidize compatible agricultural activities (such as honey production and cattle grazing) and would implement specific decommissioning provisions in which the land would be returned to substantially the same condition as existed prior to development of the solar facilities, thus allowing for a full range of future agricultural uses.
Economy – Visitor Industry: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy.	The Project would not have any effect on the economy as related to the visitor industry.
Economy – Federal Expenditures: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai'i's economy.	The Project would not involve any federal expenditures.
Economy - Potential Growth and Innovative Activities: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawai'i's economic base.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawai'i's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors. (8) Accelerate research and development of new energy-related industries based on wind, solar, ocean, underground resources, and solid waste. The Project would contribute to and further diversify Hawai'i's economy through the growing renewable energy market.
Economy - Information Industry: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawai'i as a leader in broadband and wireless communications and applications in the Pacific Region.	The Project would not have any effect on the economy as related to telecommunication and information technology.
Physical Environment - Land-based, Shoreline, and Marine Resources: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (3) Take into account the physical attributes of areas when planning and designing activities and facilities.

Objectives	Assessment of Consistency
(1) Prudent use of Hawai'i's land-based, shoreline, and marine resources. (2) Effective protection of Hawai'i's unique and fragile environmental resources.	(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage. (8) Pursue compatible relationships among activities, facilities, and natural resources. The Project area has been extensively modified by previous agricultural operations and is dominated by non-native species. Regardless, the Project has been designed to minimize ground disturbance and maintain ample, natural open space surrounding the Project facilities. Impacts to natural resources would be avoided and minimized to the extent possible through implementation of BMPs.
Physical Environment - Scenic, Natural Beauty, and Historic Resources: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historical resources.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (1) Promote the preservation and restoration of significant natural and historic resources. (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features. An AIS was conducted for the Project; historic properties within the Project area include plantation-era infrastructure and a remnant section of the Waiahole Ditch. Implementation of the Project would affect portions of these historic properties within the Project area; the portions that are not affected by the proposed improvements would be kept intact. The Project would be visible to varying degrees from surrounding areas; however, it would not obstruct or impede views of the Wai'anae Mountains, Pacific Ocean or other scenic resources. The Project facilities would introduce new visual elements within the landscape, but these would be seen in the context of other development including high-voltage transmission lines, commercial and residential structures, the rail transit system, Makakilo Quarry and other man-made features.
Physical Environment - Land, Air, and Water Quality: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives: (1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources. (2) Greater public awareness and appreciation of Hawai'i's environmental resources.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters. (4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people. BMPs would be implemented as part of the Project to avoid and minimize impacts to water quality and air quality. Once operational, the Project would provide a net benefit by replacing energy generated by burning fossil fuels with renewable energy, thereby reducing emissions of greenhouse gases.
Facility Systems – In General: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy	The Project would be consistent with the objectives and policies for this theme, particularly the following policies:

Objectives	Assessment of Consistency
and telecommunication systems that support statewide social, economic, and physical objectives.	(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities. (3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user. The Project would help to meet the state's need for renewable energy by providing up to 12.5 MW of solar energy and 50 MWh of battery storage. Based on the 25-year fixed-price PPA, the energy produced by the Project would be sold at a price that is less than the current cost of fossil fuel power and would help to hedge long-term price volatility. The Project would also help to improve electric grid stability by enabling Hawaiian Electric to utilize stored solar energy to meet peak demand. The Project area would be made available for compatible agriculture activities, such as honey production and cattle grazing/production, contributing to agricultural production while requiring minimal water resources.
Facility Systems – Solid and Liquid Wastes: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives: (1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes. (2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (2) Promote reuse and recycling to reduce solid and liquid wastes and employ a conservation ethic. Construction and operation of the Project would generate very little waste. At the end of operations, the Project would be decommissioned, including removal of all Project equipment from the Project area. It is anticipated that most materials would be either salvaged or recycled. Only a small portion of the Project equipment would be disposed of as solid waste; these materials would be disposed of at authorized sites in accordance with applicable laws.
Facility Systems – Water: Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.	The Project would not have any effect on facility systems related to water.
Facility Systems – Transportation: Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives: (1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods. (2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.	The Project would not have any effect on facility systems related to transportation.
Facility Systems – Energy: Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all: (1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;	The Project would be consistent with the objectives and policies for this theme, particularly the following policies: (1) Support research and development as well as promote the use of renewable energy sources The Project would help to meet the state's need for renewable energy by providing up to 12.5 MW of solar energy and 50

Objectives	Assessment of Consistency
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawai'i's dependence on imported fuels for electrical generation and ground transportation; (3) Greater diversification of energy generation in the face of threats to Hawai'i's energy supplies and systems; (4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and (5) Utility models that make the social and financial interests of Hawai'i's utility customers a priority.	MWh of battery storage, which is enough electricity for approximately 4,600 homes on O'ahu (based on average energy use). The Project is expected to offset the use of approximately 545,794 barrels of fuel and 64 tons of coal and would decrease greenhouse gas emissions by approximately 244,394 tons over its lifetime (Hawaiian Electric, 2019b).
Facility Systems – Telecommunications: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.	The Project would not have any effect on facility systems related to telecommunications.
Socio-Cultural Advancement - Housing: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives: (1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more rental and for sale affordable housing is made available to extremely low-, very low-, lower-, moderate-, and above moderate-income segments of Hawai'i's population. (2) The orderly development of residential areas sensitive to community needs and other land uses. (3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.	The Project would not have any effect on housing.
Socio-Cultural Advancement – Health: Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives: (1) Fulfillment of basic individual health needs of the general public. (2) Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities. (3) Elimination of health disparities by identifying and addressing social determinants of health.	The Project would not have any effect on health.
Socio-Cultural Advancement – Education: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.	The Project would not have any effect on education.

Objectives	Assessment of Consistency
Socio-Cultural Advancement – Social Services: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.	The Project would not have any effect on social services.
Socio-Cultural Advancement – Leisure: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.	The Project would not have any effect on leisure activities.
Socio-Cultural Advancement – Individual Rights and Personal Well-Being: Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.	The Project would not have any effect on individuals' rights and personal well-being.
Socio-Cultural Advancement – Culture: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.	The Project would not have any effect on culture.
Socio-Cultural Advancement – Public Safety: Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives: (1) Assurance of public safety and adequate protection of life and property for all people. (2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances. (3) Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.	The Project would not have any effect on public safety.
Socio-Cultural Advancement – Government: Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives: (1) Efficient, effective, and responsive government services at all levels in the State. (2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.	The Project would not have any effect on government.

Table 9. Project Consistency with the Priority Guidelines of the Hawai'i State Planning Act

Priority Guidelines	Assessment of Consistency
Economic Priority Guidelines	
(a) To stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy	The Project would be consistent with these guidelines, particularly the following: (1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises (A)(i) Encourage investments which reflect long-term commitments to the State (A)(iii) Diversify the economy The Project would be part of the growing renewable energy industry in Hawai'i, helping to both diversify Hawai'i's economy and provide valuable job opportunities to residents. The power generated by the Project would be sold to Hawaiian Electric under a new 25-year PPA.
(b) To promote the economic health and quality of the visitor industry	The Project would not have any effect on the visitor industry.
(c) To promote the continued viability of the sugar and pineapple industries	The Project would not have any effect on the sugar and pineapple industries.
(d) To promote the growth and development of diversified agriculture and aquaculture	The Project would be consistent with these guidelines, particularly the following: (7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities. The Project would support and subsidize agricultural activities that are compatible with the solar facilities (such as honey production and cattle grazing).
(e) Water use and development	The Project would not have any effect on water use and development.
(f) Energy use and development	The Project would be consistent with these guidelines, particularly the following: (1) Encourage the development, demonstration, and commercialization of renewable energy sources The Project would help to meet the state's need for renewable energy by providing up to 12.5 MW of solar energy and 50 MWh of battery storage. It would also meet the needs of Hawaiian Electric's system by allowing energy to be stored and dispatched at times of higher demand and offset night-time fossil fuel generation.
(g) To promote the development of the information industry	The Project would not have any effect on the information industry.
Population Growth and Land Resources Priority Guidelines	
(a) To effect desired statewide growth and distribution	The Project would not have any effect on statewide growth and distribution.
(b) Regional growth distribution and land resource utilization	The Project would be consistent with these guidelines, particularly the following: (2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district. (9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized. The Project area has been extensively modified by past agricultural activities and is dominated by non-native species. Impacts to natural resources within or near the Project area would be avoided and minimized through the implementation

Priority Guidelines	Assessment of Consistency
	of BMPs. Although the Project area is within the agricultural district, agricultural activities are highly constrained by site-specific factors, particularly the lack of available infrastructure and insufficient water for irrigation. Consistent with the requirements of HRS § 205, the Project would support and subsidize compatible agricultural activities (such as honey production and cattle grazing) and would implement specific decommissioning provisions in which the land would be returned to substantially the same condition as existed prior to Project development, thus allowing for the full range of future agricultural uses.
Crime and Criminal Justice Priority Guidelines	
In the area of crime and criminal justice	The Project would not have any effect on crime and criminal justice.
Affordable Housing Priority Guidelines	
Provision of affordable housing	The Project would not have any effect on affordable housing.
Quality Education Priority Guidelines	
To promote quality education	The Project would not have any effect on quality education.
Sustainability Priority Guidelines	
To promote sustainability	The Project would be consistent with these guidelines, particularly the following: (1) Encouraging balanced economic, social, community, and environmental priorities (2) Encouraging planning that respects and promotes living within the natural resources and limits of the State (3) Promoting a diversified and dynamic economy (4) Encouraging respect for the host culture (5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations The Project would help to meet Hawai'i's economic, social, community and environmental priorities by providing clean, renewable solar energy with minimal adverse effects on the environment. In addition to helping meet the state's renewable energy goals, the Project would also contribute to economic and social welfare by creating local employment opportunities, providing a source of revenue for the state, helping to hedge against long-term volatility in energy prices, and improving stability of the electric grid.
Climate Change Adaptation Priority Guidelines	
To prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy	The Project would be consistent with these guidelines, particularly the following: (10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy The Project would involve generation and storage of clean, renewable solar energy, thus contributing to Hawai'i's renewable energy goals. The solar energy from the Project would replace a portion of electricity that is currently generated by burning fossil fuels, thus reducing greenhouse gas emissions.

8.2.1 Functional Plans

In addition to establishing goals, objectives, and policies for the State of Hawai'i, HRS § 226 also directs state agencies to prepare state functional plans for statewide priority issues. A total of 13 functional plans have been developed related to: agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism and transportation. The plans most relevant to the Project are the agriculture and energy state plans; a brief discussion of the Project's consistency with each of these plans follows.

Agriculture Functional Plan. The agriculture functional plan describes the vision of agriculture in Hawai'i as having (a) growth and size of the sugar industry determined by optimal economic efficiency; (b) continued growth in pineapple production with more growth expected in production of fresh pineapple; and (c) greatest growth in diversified crops and products (DOA, 1991). The plan outlines actions directed at the factors and conditions that are key to achieving this vision; these relate to industry research and development, agricultural pests and the environment, land and water, and services and infrastructure. The plan identifies objectives, policies and priority actions relative to each of these issues. The majority of these relate to the broader agricultural industry and thus are not applicable to the Project; however, the Project would be consistent with the following:

- ***Policy H(1):*** *Provide suitable public lands at a reasonable cost and with long-term tenure for commercial agricultural purposes*
- ***Action H(2)(c):*** *Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.*

The Project is located within the State agricultural land use district; no portion of the Project area has been designated or identified as IAL. As discussed in Section 7, pursuant to HRS § 205-4.5(a)(21), the Project is permitted within the State agricultural land use district with approval of a Special Use Permit by the Land Use Commission, and compliance with the provisions related to decommissioning, proof of financial security, and making the Project area available for compatible agricultural activities at a lease rate below fair market rent. As noted earlier and described in more detail in Section 3.2.2, the Project area would be made available for compatible agricultural activities, such as honey production and cattle grazing and production. The Project also incorporates specific decommissioning requirements in which the land would be returned to substantially the same condition as existed prior to Project development, thus allowing for the full range of future agricultural uses. As the solar facilities are a permitted land use in the agricultural district and the compatible agricultural activities would be supported and subsidized over the 25-year Project term, the Project is consistent with the agriculture functional plan.

Energy Functional Plan. The energy functional plan describes an overall objective of achieving dependable, efficient and economical statewide energy systems capable of supporting the needs of the people and increasing energy self-sufficiency. The plan specifically identifies the need to reduce

dependence on imported fossil fuels such as oil and the state's vulnerability to supply disruptions (DBEDT, 1991). The plan establishes policies and actions to promote energy conservation and efficiency, displace fossil fuel consumption, support public education and legislation on energy, improve the development and management of energy, and assist with energy emergency preparedness. The following polices and actions are applicable to the Project:

- ***Policy B(1):*** *Displace oil and fossil fuel consumption through the application of appropriate alternate and renewable energy resources and technologies.*
- ***Action B(1)(l):*** *Expand upon the existing 20 kW photovoltaic utility-scale application*[23]

The Project would provide up to 12.5 MW of solar energy and 50 MWh of battery storage, which is enough electricity for approximately 4,600 homes on O'ahu (based on average energy use), thus offsetting the use of approximately 545,794 barrels of fuel and 64 tons of coal (Hawaiian Electric, 2019b). It is directly responsive to the need for development of renewable energy sources and displacement of fossil fuel consumption; as such, the Project is consistent with the Energy State Functional Plan.

8.3 O'ahu General Plan

The City and County of Honolulu's General Plan is a policy guidance document that presents the long-range objectives for the island of O'ahu. It is the foundation of a comprehensive planning process that addresses the physical, cultural, social, economic and environmental concerns, and is intended to provide direction for future growth on O'ahu. It presents objectives regarding the desired conditions over a 20-year planning horizon, as well as broad policies to meet those objectives and guide all levels of government, private enterprise, neighborhood and citizen groups, organizations, and individual citizens.

The General Plan was adopted in 1977 and has been subsequently updated through a series of amendments. The most recent updates were completed in December 2017 and the Proposed Revised Plan is currently in the process of being adopted. The proposed revised plan was first introduced by the City Council on April 27, 2018 as Resolution 18-093, and was re-introduced by the City Council on February 13, 2020 as Resolution 20-44; the current General Plan (1992, amended in 2002) will remain in effect until the proposed revised plan is adopted by the City Council. The Proposed Revised General Plan carries forward the basic themes and directions for growth as contained in the 1992 General Plan, and continues to focus on critical issues such as regional population, economic health, and affordable housing, while also introducing additional topics such as climate change, sea level rise and sustainability. A total of 11 areas of concern are addressed in the proposed revised plan: population, economy, natural environment and resource stewardship, housing and communities, transportation and utilities, energy, physical development and urban design; public safety and community resilience, health and education, cultural and recreation, and government operations and fiscal management (DPP, 2017b).

23 The application referred to in this action is a 20kW PVUSA system on Maui that was designed to demonstrate photovoltaics in a utility setting.

Overall, the proposed Project is consistent with the various objectives and policies contained in the proposed revised General Plan. The proposed Project would not impact objectives and policies related to population, housing and communities, transportation and utilities, public safety and community resilience, health and education, and government operations and fiscal management. As a result, these objectives and policies are not discussed further. The proposed Project is consistent with the applicable objectives and policies of the City and County of Honolulu's General Plan described below.

Economy

Objective A ***To promote economic opportunities that enable all the people of O'ahu to attain meaningful employment and a decent standard or living.***

Policy 1 *Support a strong, diverse and dynamic economic base resilient to changes in global conditions.*

Policy 3 *Pursue opportunities to grow and strategically develop non-polluting industries such as trade, communications, media, medical, life sciences, and technology in appropriate locations that contribute to O'ahu's long-term environmental, economic, and social sustainability.*

Objective C ***To ensure the long-term viability and continued productivity of agriculture on O'ahu.***

Policy 2 *Support agricultural diversification to help strengthen the agricultural industry and to make more locally grown food available for local consumption.*

Policy 6 *Promote small-scale farming activities and other operations, such as truck farming, flower growing, aquaculture, livestock production, taro growing, and subsistence farms.*

Policy 7 *Encourage landowners to actively use agricultural lands for agricultural purposes.*

Policy 12 *Provide plans, incentives, and strategies to ensure the affordability of agricultural land for farmers.*

Discussion: The Project would be part of the growing renewable energy industry in Hawai'i, helping to both diversify Hawai'i's economy and provide valuable job opportunities to residents, particularly short-term jobs during construction. It would generate clean, renewable solar energy and would help to meet the state's need for renewable energy by providing up to 12.5 MW of solar energy and 50 MWh of battery storage, which is enough electricity for approximately 4,600 homes on O'ahu (based on average energy use). The Project is expected to offset the use of approximately 545,794 barrels of fuel and 64 tons of coal and would decrease greenhouse gas emissions by approximately 244,394 tons over its lifetime (Hawaiian Electric, 2019b). Furthermore, the Project would seek to balance agricultural and renewable energy needs. Specifically, it would support and subsidize compatible agricultural activities (such as honey production and cattle grazing) and would implement specific decommissioning provisions in which the land would be returned to substantially the same condition as existed prior to development of the solar facilities, thus allowing for the full range of future agricultural uses.

Natural Environmental and Resource Stewardship

Objective A ***To protect and preserve the natural environment.***

Policy 1 *Protect O'ahu's natural environment, especially the shoreline, valleys, ridges, and watersheds, from incompatible development.*

Policy 4 *Require development projects to give due consideration to natural features and hazards such as slope, inland and coastal erosion and flood hazards, water-recharge areas, and existing vegetation, as well as to plan for coastal hazards that threaten life and property.*

Policy 6 *Design and maintain surface drainage and flood-control systems in a manner which will help preserve natural and cultural resources.*

Policy 7 *Protect the natural environment form damaging levels of air, water, and noise pollution.*

Policy 8 *Protect plants, birds, and other animals that are unique to the State of Hawai'i and O'ahu, and protect their habitats.*

Policy 12 *Plan and prepare for the impacts of climate change on the natural environment, including strategies of adaptation.*

Objective B ***To preserve and enhance natural landmarks and scenic views of O'ahu for the benefit of both residents and visitors as well as future generations.***

Policy 1 *Protect the Island's significant natural resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shorelines, fishponds, and bays; and reefs and offshore islands.*

Policy 2 *Protect O'ahu's scenic views, especially those seen from highly developed and heavily traveled areas.*

Policy 3 *Locate and design public facilities, infrastructure, and utilities to minimize the obstruction of scenic views.*

Discussion: The Project area has been extensively modified by previous agricultural operations and is dominated by non-native species. The Project has been designed to minimize ground disturbance and maintain ample, natural open space surrounding the facilities. Impacts to natural resources would be avoided and minimized to the extent possible through implementation of BMPs. LID design measures would be incorporated to maintain permeability throughout the Project area while also minimizing the potential for erosion; the Project would also incorporate stormwater retention BMPs during and post-construction to retain and treat stormwater within the Project area.

Although the Project components would be visible from surrounding areas, the Project would not obstruct views of the mountains, ocean or other scenic resources. Landscaping would be installed to provide visual buffering of Project equipment from adjacent areas to the extent practicable. It is anticipated that the landscaping would incorporate suitable plant material in key locations and would include native species that are ecologically and culturally appropriate for this location.

Energy

Objective A ***To increase energy self-sufficiency and maintain an efficient, reliable, resilient, and cost-efficient energy system.***

Policy 1 *Encourage the implementation of a comprehensive plan to guide and coordinate energy conservation and renewable energy development and utilization programs.*

Policy 2 *Support and encourage programs and projects, including economic incentives, regulatory measures, and educational efforts, which will reduce O'ahu's dependence on fossil fuels as its primary source of energy.*

Policy 7 *Manage our resources and the development of our communities in line with the long-term goals of net zero to net positive performance in areas of energy, carbon emissions, waste streams, all utilities, and food security.*

Policy 9 *Consider health, safety, environmental, cultural, and aesthetic impacts, as well as resource limitations, land use patterns, and relative costs in all major decisions on renewable energy.*

Objective B ***To conserve energy through the more efficient management of its use and through more energy-efficient technologies.***

Policy 5 *Encourage the implementation of an adaptable and reliable electrical grid, energy transmission, energy storage, and energy generation technologies.*

Objective C ***To foster an ethic of energy conservation that inspires residents to engage in sustainable practices.***

Policy 4 *Provide communities with timely, relevant, and accurate information concerning renewable energy facilities proposed in their area.*

Discussion: The Project would help to meet the state's goal of 100 percent renewable energy sources by 2045 by providing up to 12.5 MW of solar energy and 50 MWh of battery storage, which is enough electricity for approximately 4,600 homes on O'ahu (based on average energy use). The Project is expected to offset the use of approximately 545,794 barrels of fuel and 64 tons of coal and would decrease greenhouse gas emissions by approximately 244,394 tons over its lifetime (Hawaiian Electric, 2019b). Through Project-specific outreach efforts, as well as the HRS § 343 environmental review process, the public has been informed of the proposed renewable energy facility and provided opportunities for input at various stages, including the pre-assessment consultation process and the Draft EA 30-day public comment period. Additional opportunities for input will occur through the discretionary permitting process.

Physical Development and Urban Design

Objective A ***To coordinate changes in the physical environment of O'ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.***

Policy 10 *Discourage uses which are major sources of noise, air, and light pollution.*

Policy 11 *Encourage siting and design solutions that seek to reduce exposure to natural hazards, including those related to climate change and sea level rise.*

Policy 13 *Promote opportunities for the community to participate meaningfully in planning and development processes, including new forms of communication and social media.*

Discussion: The Project would be designed to minimize impacts related to noise, air, and light pollution during construction and operation, and is not anticipated to be a major source of these pollutants. The Project would not be located in a sea-level rise exposure area, flood hazard zone, or tsunami evacuation zone, and would not be expected to increase exposure to natural hazards. Once constructed, the Project would generate clean renewable energy which would replace the burning of fossil fuel for production of electricity, thus offsetting greenhouse gas emissions and providing a beneficial impact relative to climate change. As noted above, the HRS § 343 environmental review and discretionary permit processes include opportunities for meaningful community input.

Culture and Recreation

Objective B ***To protect, preserve, and enhance O'ahu's cultural, historic, architectural, and archaeological resources.***

Policy 2 *Identify and, to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.*

Discussion: An AIS was conducted for the Project, including detailed background research and a 100 percent pedestrian inspection of the Project area (see Attachment F). The AIS identified two historic properties within the Project area, consisting of irrigation and plantation infrastructure and a remnant portion of the Waiahole Ditch. The Draft AIS Report was submitted to SHPD in compliance with HRS § 6E and HAR § 13-284 on February 5, 2020; SHPD's review and acceptance of the AIS Report is pending. Implementation of the Project would affect portions of these historic properties within the Project area; the portions that are not affected by the proposed improvements would be kept intact. Based on the conclusions regarding significance and documentation to date, pursuant to HAR § 13-284-7 and subject to review and concurrence by SHPD, the effect determination for the Project is "no historic properties affected" with a recommendation for no further historic preservation work. AES intends to obtain SHPD's acceptance of the AIS and concurrence with the effect determination prior to the Planning Commission hearing for the Special Use Permit application.

8.4 'Ewa Development Plan

The City and County of Honolulu's General Plan requires that community development plans be adopted by the City Council for each judicial district. These development plans are intended to provide detail for the elements presented in the General Plan and emphasize those elements most relevant to the issues and conditions of the specific area plan in order to guide public policy, infrastructure investment and land use decision making over the next 25 years. The 'Ewa Development Plan was originally adopted by

the City Council in 1997 and was most recently revised in 2013 (Ordinance 13-26). The revised plan maintains the vision for protecting agricultural land, open space and natural, historic, and cultural resources; developing a secondary urban center around the City of Kapolei; building master planned residential communities that support walking, biking, and transit use; and providing adequate infrastructure to serve both existing and planned development (DPP, 2013).

The key elements of the vision for development of ‘Ewa include (1) community growth boundary; (2) retention of agricultural lands; (3) open space and greenways; (4) Kalaeloa Regional Park; (5) secondary urban center; (6) master planned residential communities; (7) communities designed to support non-automotive travel; (8) conservation of natural resources; (9) preservation and enhancement of historic and cultural resources; and (10) phased development. The community growth boundary is intended to give long-range protection from urbanization for prime agricultural land and for preservation of open space while providing adequate land for urban development. The proposed Project is located outside the community growth boundary and as a non-urban land use, it would be consistent with this demarcation. Specific policies and guidelines that are applicable to the Project include the following:

3.1 Open Space Preservation and Development

3.1.1 General Policies

- *Use open space to:*
  - *Provide long-range protection for diversified agriculture on lands outside the Community Growth Boundary*
  - *Protect scenic views and natural, cultural, and historic resources*
  - *Preserve natural gulches and ravines as drainageways and stormwater retention areas*

3.1.3 Guidelines

3.1.3.2 Natural Gulches and Drainageways

- *Where practical, retain drainageways as natural or man-made vegetated channels rather than concrete channels.*

Discussion: As defined in the Open Space Map for the ‘Ewa Development Plan, the Project would be located in an area that is generally identified as a combination of Preservation and Agricultural Areas, interspersed with natural drainageways/gulches. The plan defines Agricultural Areas as “land with agricultural value by virtue of current agricultural use or high value for future agricultural use.” Preservation Areas are defined as “lands with natural, cultural or scenic resource value.” Examples of Preservation Areas include lands necessary for protecting watersheds, water resources and water supplies; lands necessary for the conservation, preservation and enhancement of sites with scenic, historic, archaeological or ecological significance; and lands with topography, soils, climate or other related environmental factors that may not be normally adaptable or presently needed for urban, rural or agricultural use.

Although historically used for cultivation of sugar cane, the Project area has been fallow for an extended period of time with intermittent cattle grazing. Its current use for agricultural purposes is constrained by the site conditions, lack of infrastructure, and insufficient water for irrigation. In addition to providing clean, renewable energy, the Project area would also be made available for compatible agricultural uses at a lease price well below market value and would provide support facilities for compatible activities, such as beekeeping and cattle grazing, thus contributing to diversified agriculture in the ʻEwa District. As part of the decommissioning plan, the site would be restored to existing conditions at the end of the Project, such that the full range of potential agricultural uses would be preserved for future generations.

The Project would be visible to varying degrees from surrounding areas; however, it would not obstruct or impede views of the Waiʻanae Mountains, Pacific Ocean or other scenic resources. The Project facilities would introduce new visual elements within the landscape, but these would be seen in the context of other development including high-voltage transmission lines, commercial and residential structures, the rail transit system, Makakilo Quarry and other man-made features. Significant views and vistas that are identified in the ʻEwa Development Plan (Table 3.2 of the ʻEwa Development Plan) include views of the Waiʻanae Range from H-1 Freeway between Kunia Road and Kaloʻi Gulch and from Kunia Road, as well as general mauka and makai views. As discussed in Section 6.6, the Project area is located on the lower slopes of the Waiʻanae Range and views of the Project area from the H-1 Freeway and Kunia Road would be at least partially blocked by existing topography, vegetation and intervening structures located along the roadway corridors; views of the broader Waiʻanae Range would not be affected, such that the identified viewplanes would not be substantially degraded.

The Project area includes tributaries to Kaloʻi Gulch, which run along the southern boundary and through the central portion of the Project area. These features are typically dry and only carry water during and immediately following rain events. The Project has been designed to avoid these features to the maximum extent practicable. The only direct impacts would be associated with construction of a road crossing to allow for access between the various solar arrays. The crossing would be designed to have as small of a footprint as possible and to maintain unobstructed flows following rain events. As such, the Project would not significantly affect the form or function of the tributaries to Kaloʻi Gulch.

As the Project would balance renewable energy and agricultural needs, while also maintaining elements of open space and natural drainageways within the Project area, it is expected to be consistent with the relevant designations in the ʻEwa Development Plan.

3.4 Historic and Cultural Resources

3.4.1 General Policies

- *Preserve significant historic features from the plantation era and earlier periods.*
- *Vary the treatment of sites according to their characteristics and potential value.*
- *Retain significant vistas whenever possible.*

3.4.2 Guidelines

3.4.2.5 Native Hawaiian Cultural and Archaeological Sites

- *Require preservation in situ for those features that the State Historic Preservation Officer has recommended for such treatment.*

Discussion: An AIS was conducted for the Project, including detailed background research and a 100 percent pedestrian inspection of the Project area. The AIS identified two historic properties within the Project area, consisting of irrigation and plantation infrastructure and a remnant portion of the Waiahole Ditch. The Draft AIS Report was submitted and is pending review by SHPD in compliance with HRS § 6E and HAR § 13-284. Implementation of the Project would affect portions of these historic properties within the Project area; the portions that are not affected by the proposed improvements would be kept intact. Based on the conclusions regarding significance and documentation to date, pursuant to HAR § 13-284-7 and subject to review and concurrence by SHPD, the effect determination for the Project is "no historic properties affected" with a recommendation for no further historic preservation work. AES intends to obtain SHPD's acceptance of the AIS and concurrence with the effect determination prior to the Planning Commission hearing for the Special Use Permit application.

As discussed above, the Project would be visible to varying degrees from surrounding areas and would introduce new visual elements within the landscape, but would be seen in the context of other development including commercial and residential structures, the rail transit system, high-voltage transmission lines, Makakilo Quarry and other man-made features. The Project would not obstruct or impede views of the Waiʻanae Mountains, Pacific Ocean or other scenic resources. Similarly, the Project would not block views of surrounding features including those of the former mill building, which is an abandoned structure associated with the irrigation and plantation infrastructure within and near the Project area. Although the Project components would be visible beyond the mill building, they would be seen in the context of the surrounding development and would not substantially degrade the existing viewshed.

3.5 Natural Resources

3.5.1 General Policies

- *Require surveys for proposed new development areas to identify endangered species habitat, and require appropriate mitigations for adverse impacts on endangered species due to new development.*
- *Reduce light pollution's adverse impact on wildlife and human health and its unnecessary consumption of energy by using, where sensible, fully shielded lighting fixtures using lower wattage.*

Discussion: A biological resources survey was conducted to characterize the existing habitat and assess the potential for state or federally listed threatened, endangered, or otherwise rare plants or animals to occur within the Project area. In general, the biological resources in the Project area have been extensively modified by previous agricultural use and the introduction of invasive species, which has resulted in a reduction of the number and abundance of native species and habitats suitable for native species. No federally or state listed plants were documented within the Project area. Although no federally and state listed wildlife species have been observed or documented within the Project area,

several could occur within or traverse over the Project area. As discussed in Section 6.2.2, species-specific measures, as recommended by USFWS and DOFAW, would be implemented to avoid and minimize potential impacts. These measures would include requiring lighting to be shielded or directed downward and fitted with light bulbs having a correlated color temperature of four thousand Kelvin or less to minimize the attractiveness to seabirds.

9 Compliance with the Land Use Ordinance

The City and County of Honolulu's Land Use Ordinance (LUO) (Revised Ordinances of Honolulu Chapter 21) regulates land use by identifying the uses that are considered appropriate in each zoning district and the minimum standards and conditions that must be met if those uses are to be permitted. The purpose of the LUO is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the O'ahu General Plan and community development plans.

The Project area is located within the AG-1 (Restricted Agriculture) zoning district. The purpose of the AG-1 Restricted Agricultural zoning district is to conserve and protect important agricultural lands for agricultural functions. Agricultural districts are specifically addressed in Section 21-3.50-4 of the LUO, which refers to Table 21-3 (Master Use Table) for permitted uses and structures. Based on DPP's *Solar Farm Guidelines*, the Project is considered a "Type B utility installation," as it requires a Special Use Permit (DPP, 2019). According to the Master Use Table, Type B utility installations are permitted with issuance of a conditional use permit (CUP) minor permit in the AG-1 zoning district. A CUP minor would be requested from DPP for the Project following approval of the State Special Use Permit.

9.1.1 District Development Standards (LUO Article 3)

Article 3 of the LUO identifies the district development standards for the various zoning districts. Section 21-3.50-4 addresses the development standards for the agricultural district (with specific standards listed in Table 21-3.1 of the LUO). As listed in Table 10, the Project is expected to comply with the development standards for the AG-1 zoning district; compliance with the maximum height requirements is discussed below as part of the general development standards.

Table 10. Development Standards for the Restricted Agricultural (AG-1) District

LUO Standard		LUO Provision (AG-1 District)	Assessment of Project
Minimum lot area		5 acres	Approximately 861 acres
Minimum lot width/depth		150 feet	>150 feet
Yards:	Front	15 feet	>15 feet
	Side and rear	10 feet	>10 feet
			The nearest Project structure is approximately 400 feet from the lot boundary
Maximum building area (percent of zoning lot)[1]		For non-agricultural structures, 10 percent of zoning lot	Approximately 4.5 percent
Maximum height		15 - 25 feet[2]	See Section 9.1.2

[1] The LUO defines "building area" as the total area of a zoning lot covered by structures and covered open areas. It is assumed that the total area of Project structures is equivalent to the total area, as calculated in Table 2.

[2] Per Section 21-3.50-4(c), the maximum height may be increased from 15 to 25 feet if height setbacks are provided. Any portion of a structure exceeding 15 feet shall be set back from every side and read buildable area boundary line one feet for each two feet of additional height above 15 feet.

9.1.2 General Development Standards (LUO Article 4)

Article 4 of the LUO identifies the general development standards that must be met for any use or site, irrespective of the zoning district in which it is located. The general development standards that could apply to the Project include those related to height (Section 21-4.60), landscaping, screening and buffering (Sections 21-4.70 and 4.70-1), and outdoor lighting (Section 21-4.100); these are discussed below. There are no non-conforming lots or structures.

- **Heights:** Section 21-4.60 specifies that all structures shall fall within a building height envelope at a height specified by the LUO or as specified on the zoning maps. As discussed above, Section 21-3.50-4 specifies that the maximum height in the AG-1 zoning district is 25 feet, provided that the portion of the structure that exceeds 15 feet has a setback of one foot for every two feet of additional height (see Table 10). The solar photovoltaic and battery energy storage equipment would not exceed the standards related to maximum height and height setbacks.

  Pursuant to Section 21-4.60(c)(4), utility poles and antennas are exempted from zoning district height limits; it is specified that utility poles shall not exceed 500 feet from existing grade, and antennas associated with utility installations shall not exceed 10 feet above the governing height limit. It is anticipated that the electrical equipment for the substation and interconnection facilities would qualify as utility poles, and pursuant to Section 21-4.60(c)(4)(A) are subject to a height limit of 500 feet from existing grade. This equipment would range in height up to 40-60 feet, and therefore is expected to be in compliance with the height standards.

- **Landscaping, Screening and Buffering:** The development standards for a Type B utility installation require the development of a landscape plan, which emphasizes visual buffering from adjacent streets and highways, as further discussed in Section 9.1.3. As described in Section 3.3.4, the Project would incorporate landscaping in key locations, as shown in Attachment K. The general development standards identify additional landscaping, screening and buffering requirements. Specifically, Section 21-4.70 requires landscaping and screening of parking lots, automobile service stations, service and loading spaces, trash enclosures, utility substations and rooftop machinery in certain zoning districts; pursuant to Section 21-4.70(f), landscaping around utility substations is required in the country, residential, apartment, apartment mixed use and resort districts. Section 21-4.70-1 identifies other requirements for screening and buffering in specific zoning districts . As these additional landscaping, screening or buffering requirements do not apply to the AG-1 district, they are not expected to apply to the Project.

- **Outdoor Lighting:** Section 21-4.100 requires that for any commercial, industrial, or outdoor recreational development, lighting is shielded with full cut-off fixtures to eliminate direct illumination to any adjacent country, residential, apartment, apartment mixed use, or resort zoning district. If it is determined that lighting is needed at the substation, all fixtures would be fully shielded and directed downward, and fitted with light bulbs having a correlated color temperature of four thousand Kelvin or less.

9.1.3 Specific Development Requirements (LUO Article 5)

Article 5 of the LUO identifies the specific use development standards for particular conditions use categories. Relative to the proposed Project, it is expected that the development standards for Type B utility installations as provided in Section 21-5.650 will apply to the solar facilities. These standards are listed in Table 11.

Table 11. Development Standards for Type B Utility Installations

LUO Standard	LUO Provision	Project Consistency
Landscape Plan (Section 21-5.650(a)(1))	All requests for Type B utility installations shall be accompanied by a landscape plan which shall be approved by the director. Special emphasis shall be placed on visual buffering for the installation from adjacent streets and highways.	Landscaping would be installed to provide visual buffering of Project equipment from adjacent areas to the extent practicable. As described in Section 3.3.4, the landscape plan includes clustering of primarily native plant material along the eastern boundary of the Project area facing the H-1 Freeway and Farrington Highway. The landscaping plan is included in Attachment H, with additional supporting information provided in Attachment K.
Utility Installations for Telecommunications (Section 21-5.650(a)(2))	Type B utility installations for telecommunications shall provide fencing or other barriers to restrict public access within the area exposed to a power density of 0.1 milliwatt/cm2 for all associated antennas involving radio frequency (RF)or microwave transmissions.	The Project is not a telecommunication project; however, a chain-link fence would be installed around the perimeter of the Project as well as additional fencing around the substation to maintain site security.
Antenna Heights (Section 21-5.650(a)(3))	In residential districts where utility lines are predominantly located underground, antennas shall not exceed the governing height limit.	The Project area is not within a residential district.

9.1.4 Off-Street Parking and Loading (LUO Article 6)

Article 6 of the LUO identifies the off-street parking and loading requirements, which are intended to minimize street congestion and traffic hazards, and to provide safe and convenient access to residences, businesses, public services and places of public assembly. Table 21-6.1 specifies that the off-street parking requirements for utility installations (Type A or B) shall be determined by the director.

Normal operation of the Project would not require onsite staff; as such, the facility would not be manned. Period maintenance and inspection of the facilities would occur and would require employees to drive to various locations throughout the Project area. As such, no centralized parking facilities are planned.

10 Compliance with HRS § 205, Part III

HRS § 205 (Part III) establishes the basis for designation of IAL to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency, and assure the availability of agriculturally suitable lands. HRS § 205-42 defines IALs as lands that "(1) are capable of producing sustained high agricultural yields when treated and managed according to accepted farming methods and technology; (2) contribute to the State's economic base and produce agricultural commodities for export or local consumption; or (3) are needed to promote the expansion of agricultural activities and income for the future, even if currently not in production."

HRS § 205 identifies specific standards and criteria for the identification of IALs and establishes three processes by which IALs may be designated: (1) identification and designation of public lands per HRS § 205-44.5; (2) voluntary petition by a landowner per HRS § 205-45; and (3) mandatory identification of potential IALs by each county per HRS § 205-47.

No portion of the Project area has been designated or identified as IAL. As public lands are defined to exclude lands to which the University of Hawaii holds title (in accordance with HRS § 171-2), the UH West O'ahu Mauka Lands property is not subject to the IAL designation process established under HRS § 205-44.5, nor has the University of Hawai'i voluntarily petitioned for these lands to be designated as IAL pursuant to HRS § 205-45. With respect to the county-led process required under HRS § 205-47, the Project area was not included in the City and County of Honolulu's recommendation of lands for IAL designation per Resolution No. 18-233, CD1, FD1 (Honolulu City Council, 2019), as this process specifically excluded state-owned land. As such, the Project would comply with HRS § 205 (Part III).

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Attachment A
Project Figures

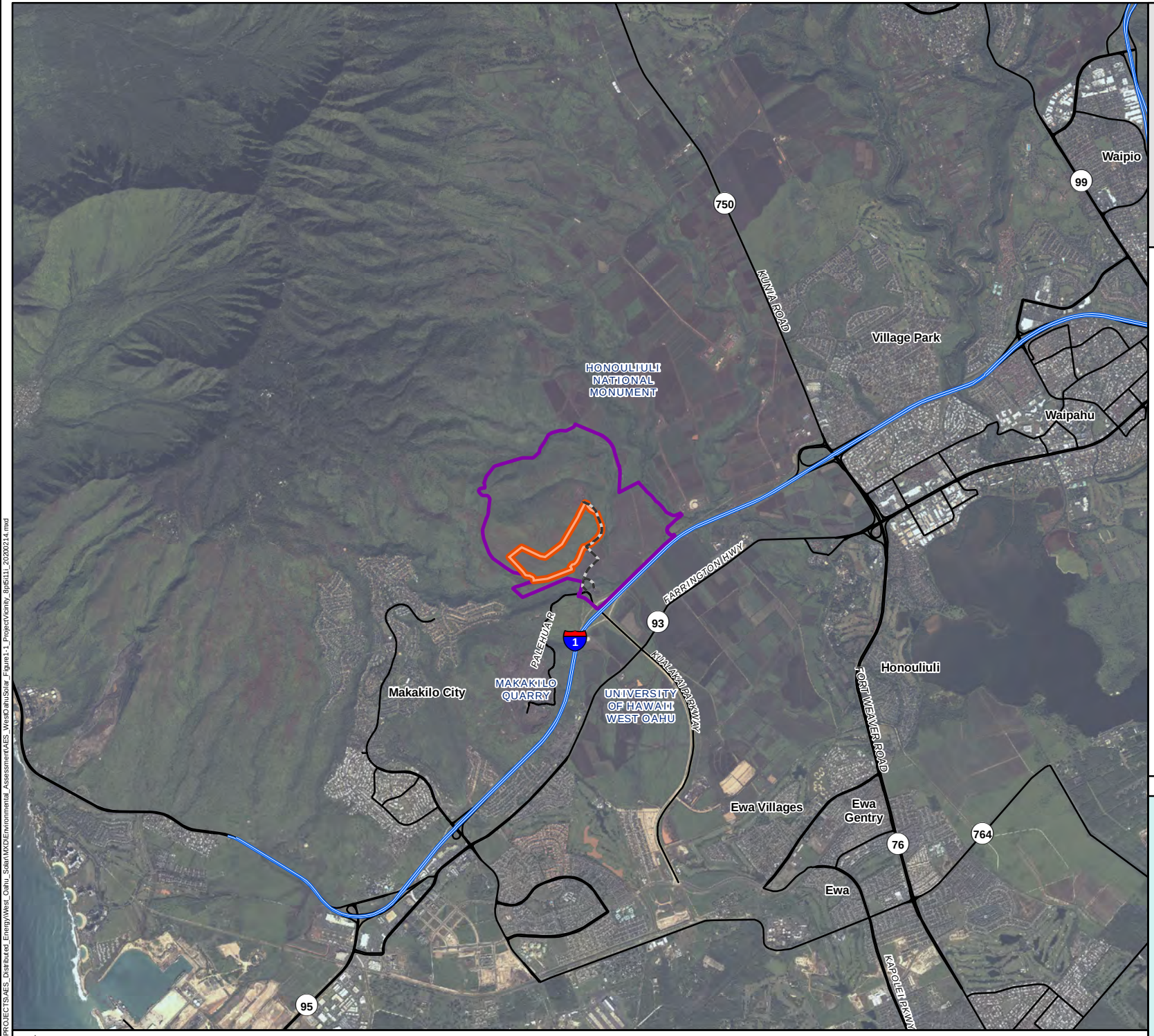


Figure 1

West Oahu Solar Plus Storage Project

AES Distributed Energy

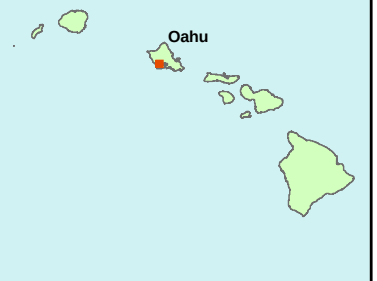
Project Vicinity

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway

TETRA TECH

Reference Map



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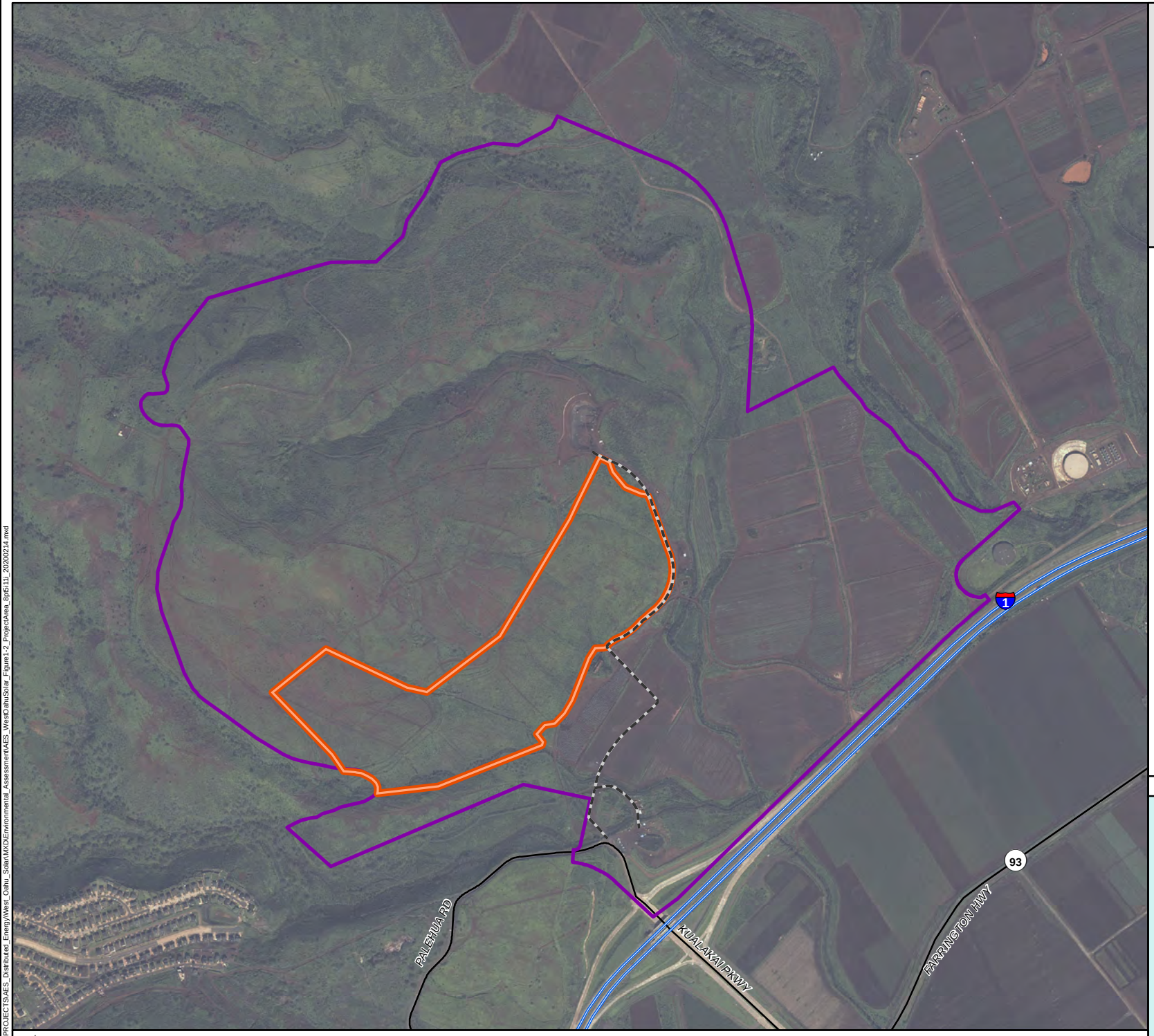

Figure 2

West Oahu Solar Plus Storage Project

AES Distributed Energy

Project Area

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway

TETRA TECH

Reference Map

1:15,000 WGS 1984 UTM Zone 4N

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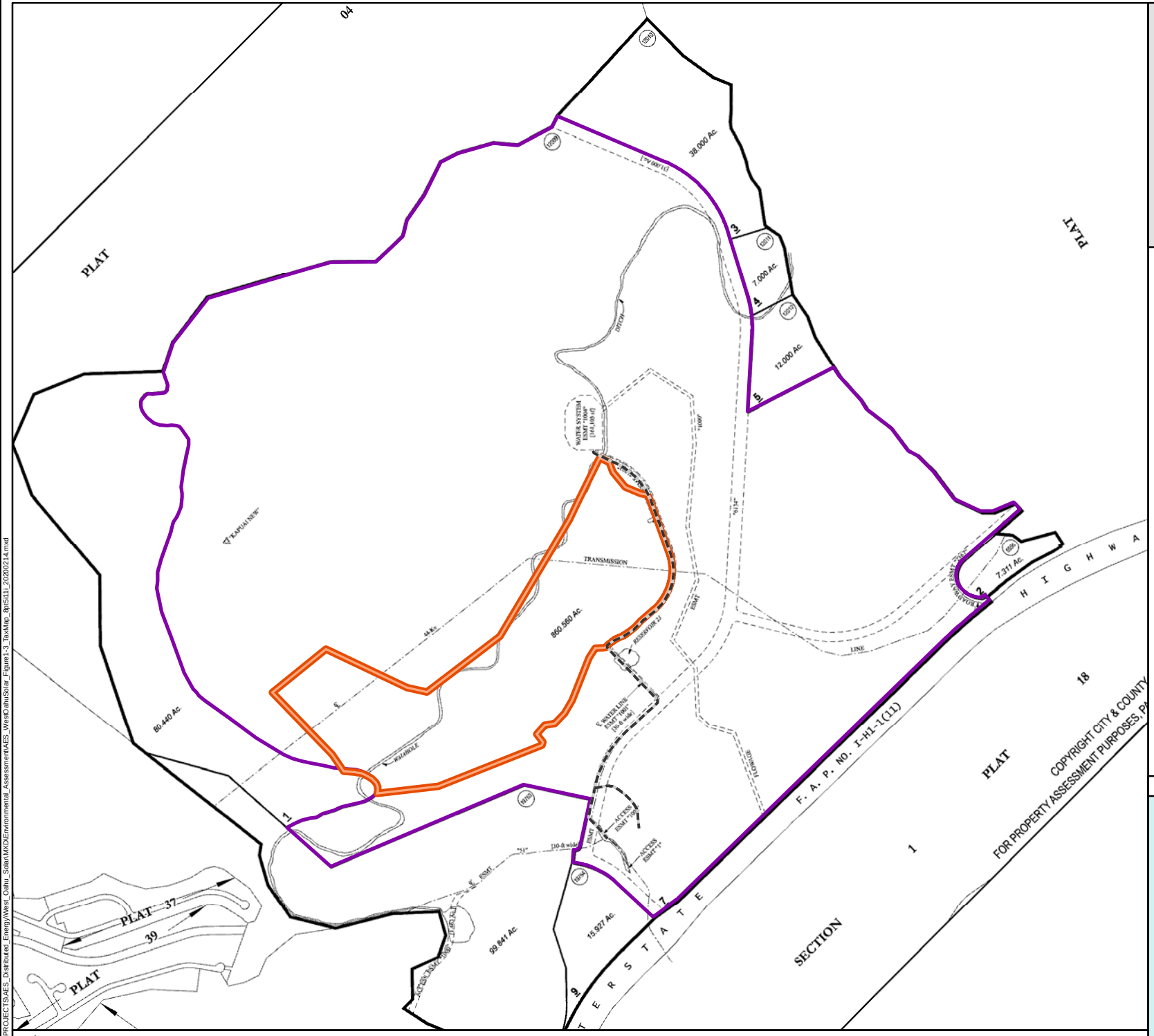

Figure 3

West Oahu Solar Plus Storage Project

AES Distributed Energy

Tax Map

HONOLULU COUNTY, HI

Project Area
Property Boundary
Existing Access Road

Source:
City and County of Honolulu

Zone 9, Section 2, Plat 002

TETRA TECH

Reference Map

1:15,000 WGS 1984 UTM Zone 4N

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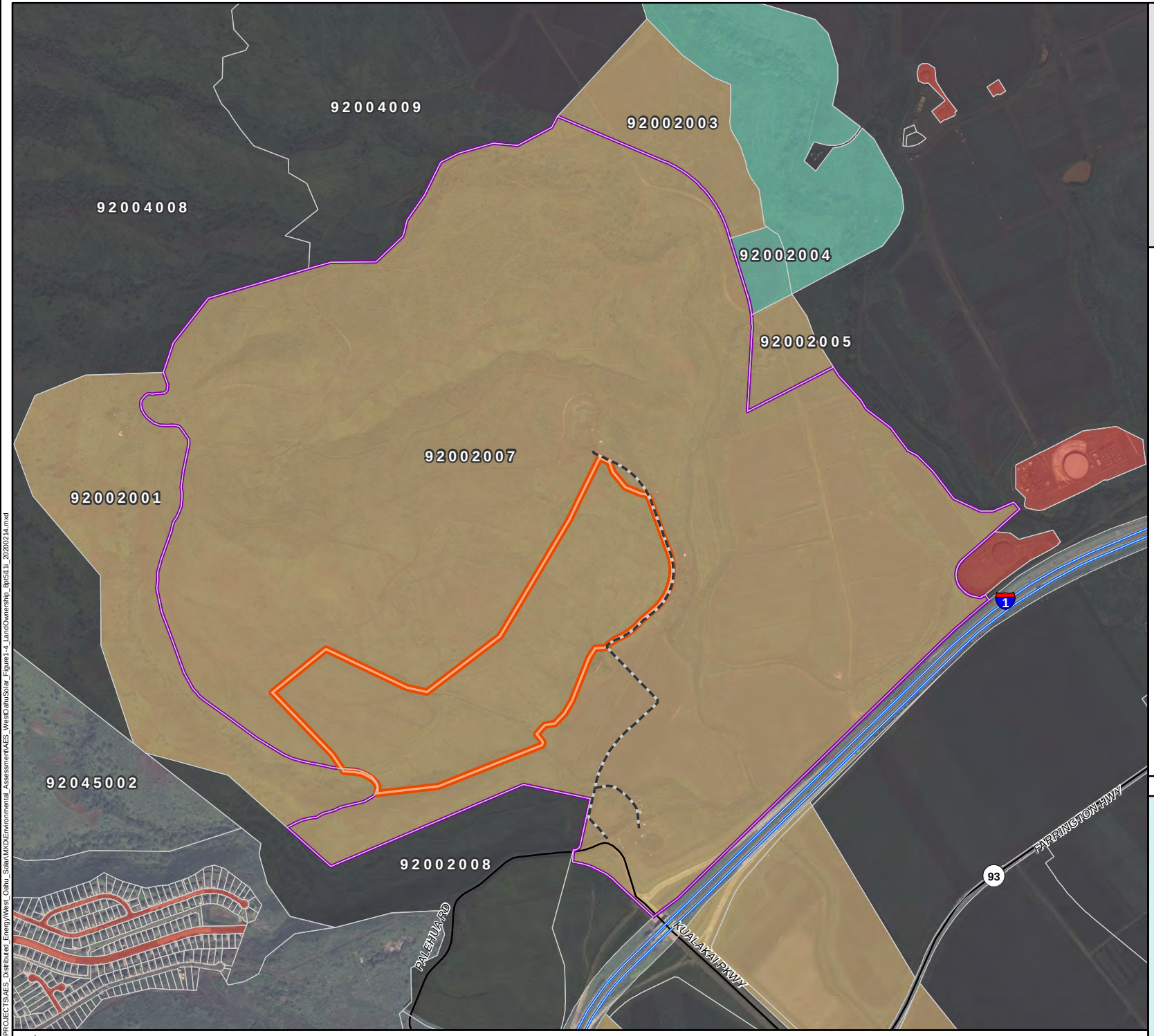


Figure 4

West Oahu Solar Plus Storage Project

AES Distributed Energy

Land Ownership

HONOLULU COUNTY, HI

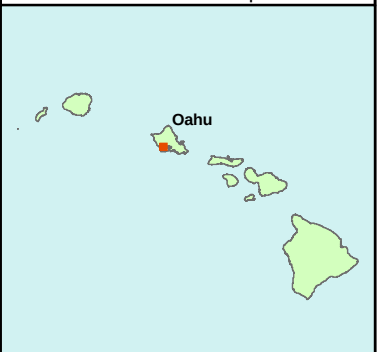
- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway

Land Ownership

- County
- Federal
- State
- Private (Large Land Owner)
- Private (Other)

TETRA TECH

Reference Map



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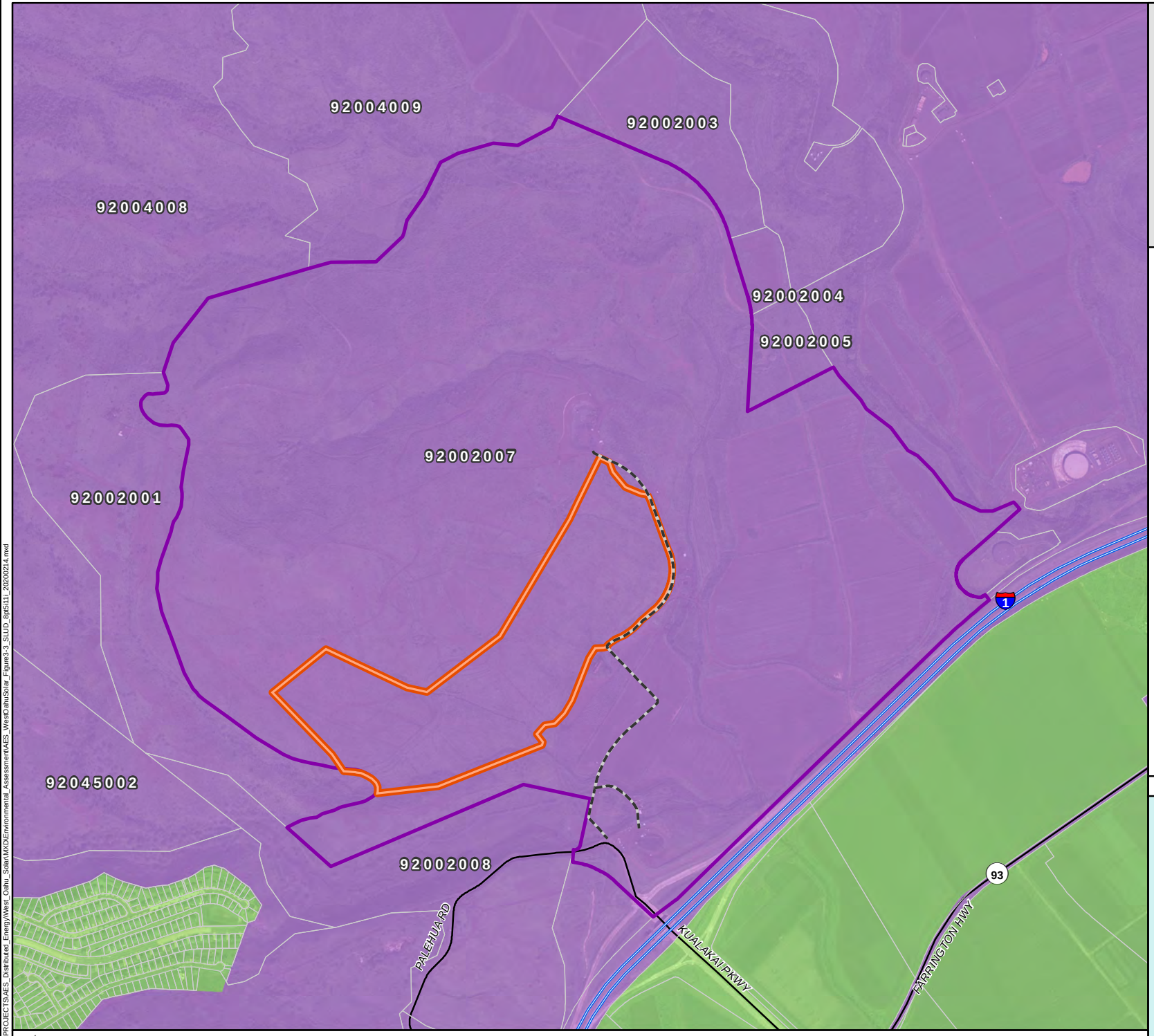


Figure 5

West Oahu Solar Plus Storage Project

AES Distributed Energy

State Land Use Districts

HONOLULU COUNTY, HI

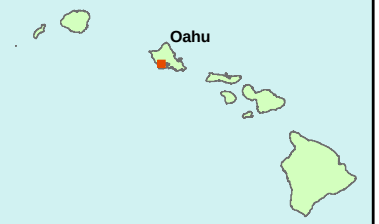
- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway

State Land Use

- Agricultural Land Use District
- Urban Land Use District

TETRA TECH

Reference Map



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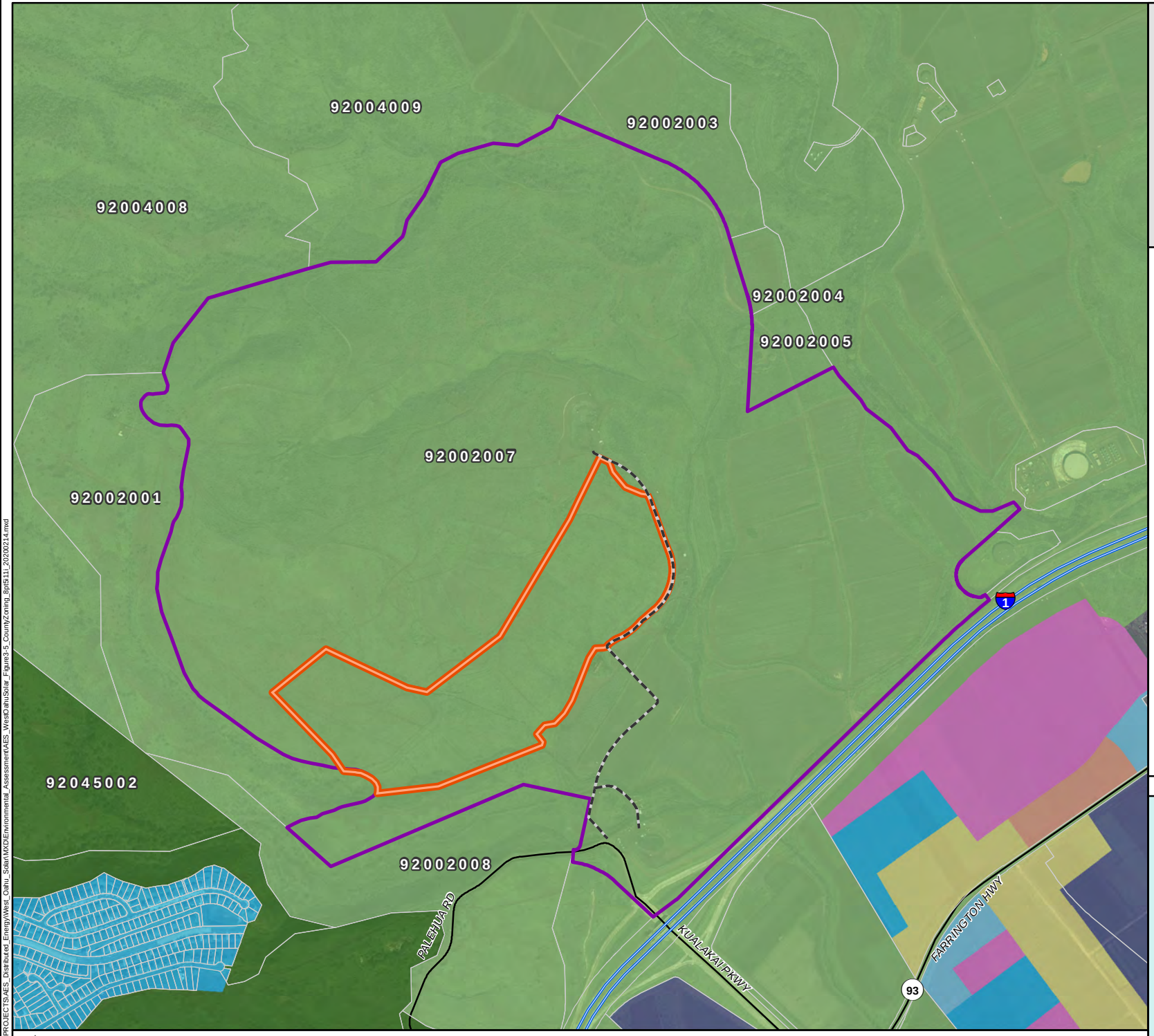

Figure 6

West Oahu Solar Plus Storage Project

AES Distributed Energy

County Zoning

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway

Zoning Classes

- Low- and Medium-Density Apartment District
- Restricted Agriculture District
- General Agriculture District
- Medium-density Apartment Mixed Use District
- Neighborhood Business District
- Community Business/ Community Business Mixed Use District
- General Preservation District
- Residential District

TETRA TECH

Reference Map

1:15,000 WGS 1984 UTM Zone 4N

0 0.25 0.5 1 Miles

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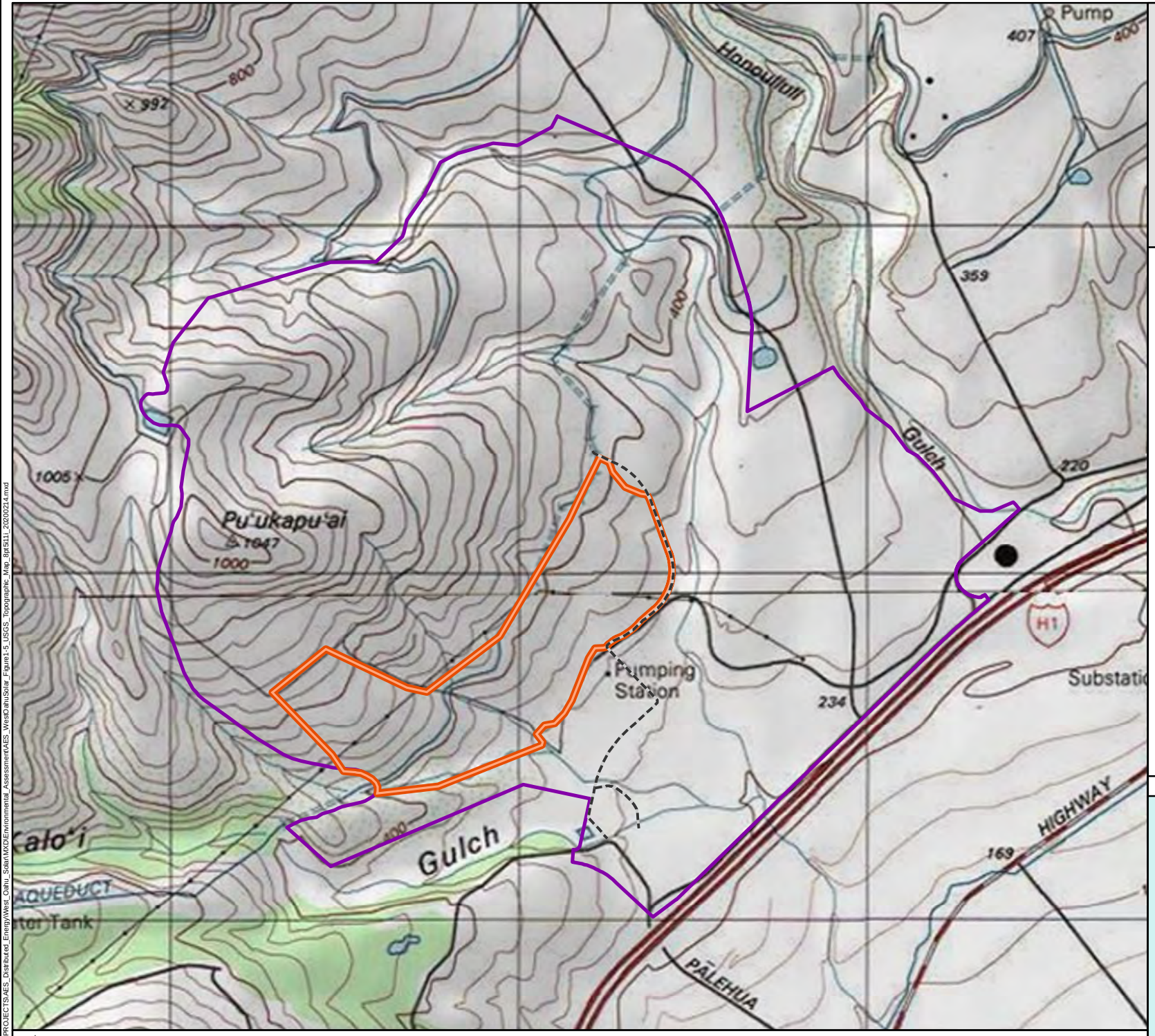


Figure 7

West Oahu Solar Plus Storage Project

AES Distributed Energy

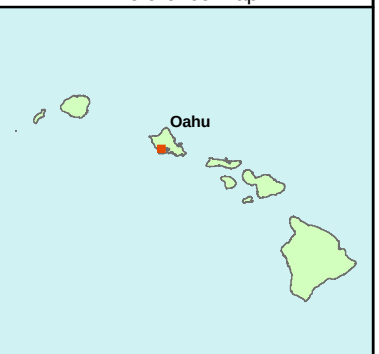
USGS Topographic Map

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road

TETRA TECH

Reference Map



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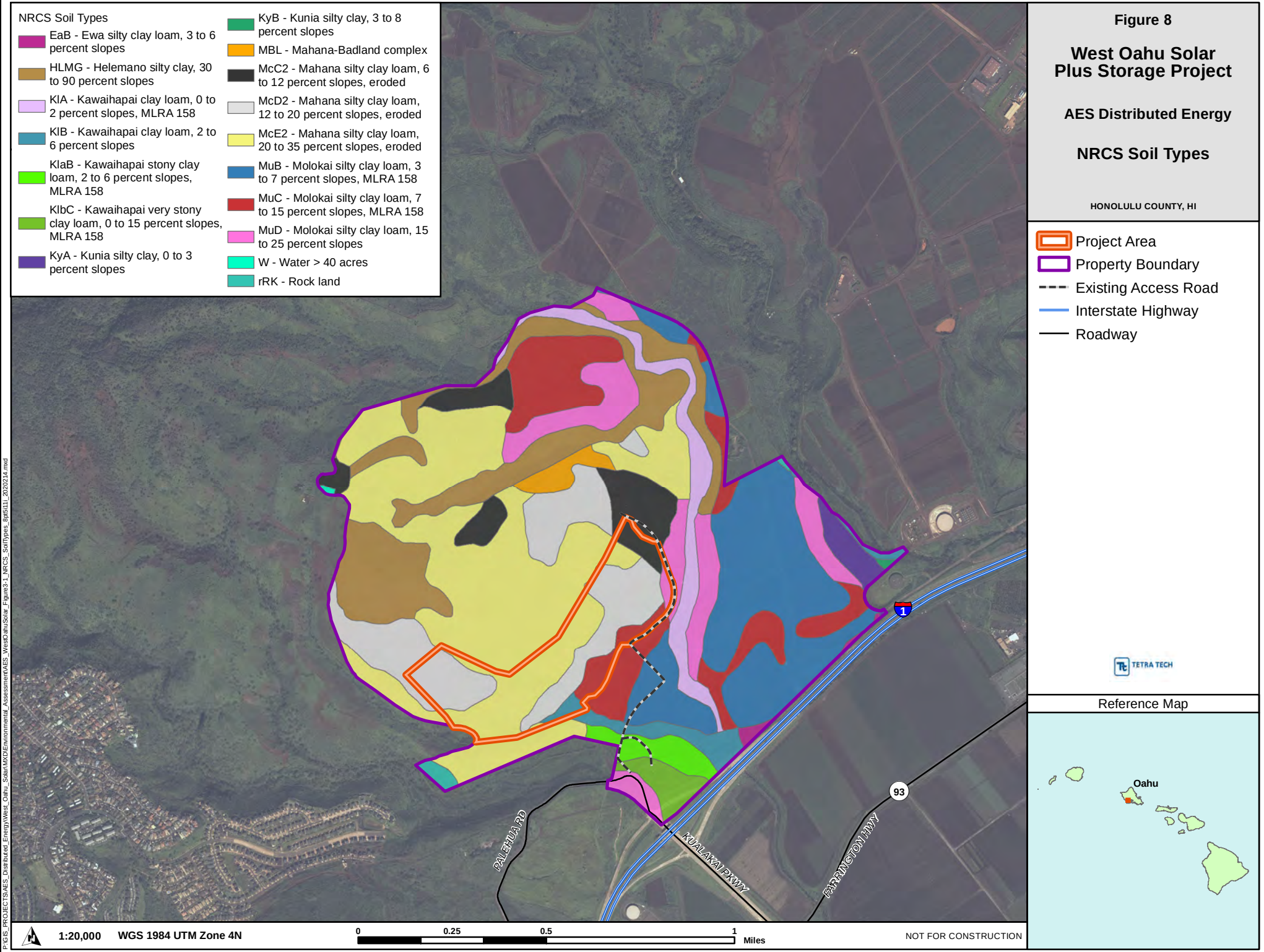

Figure 8

West Oahu Solar Plus Storage Project

AES Distributed Energy

NRCS Soil Types

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway

TETRA TECH

Reference Map

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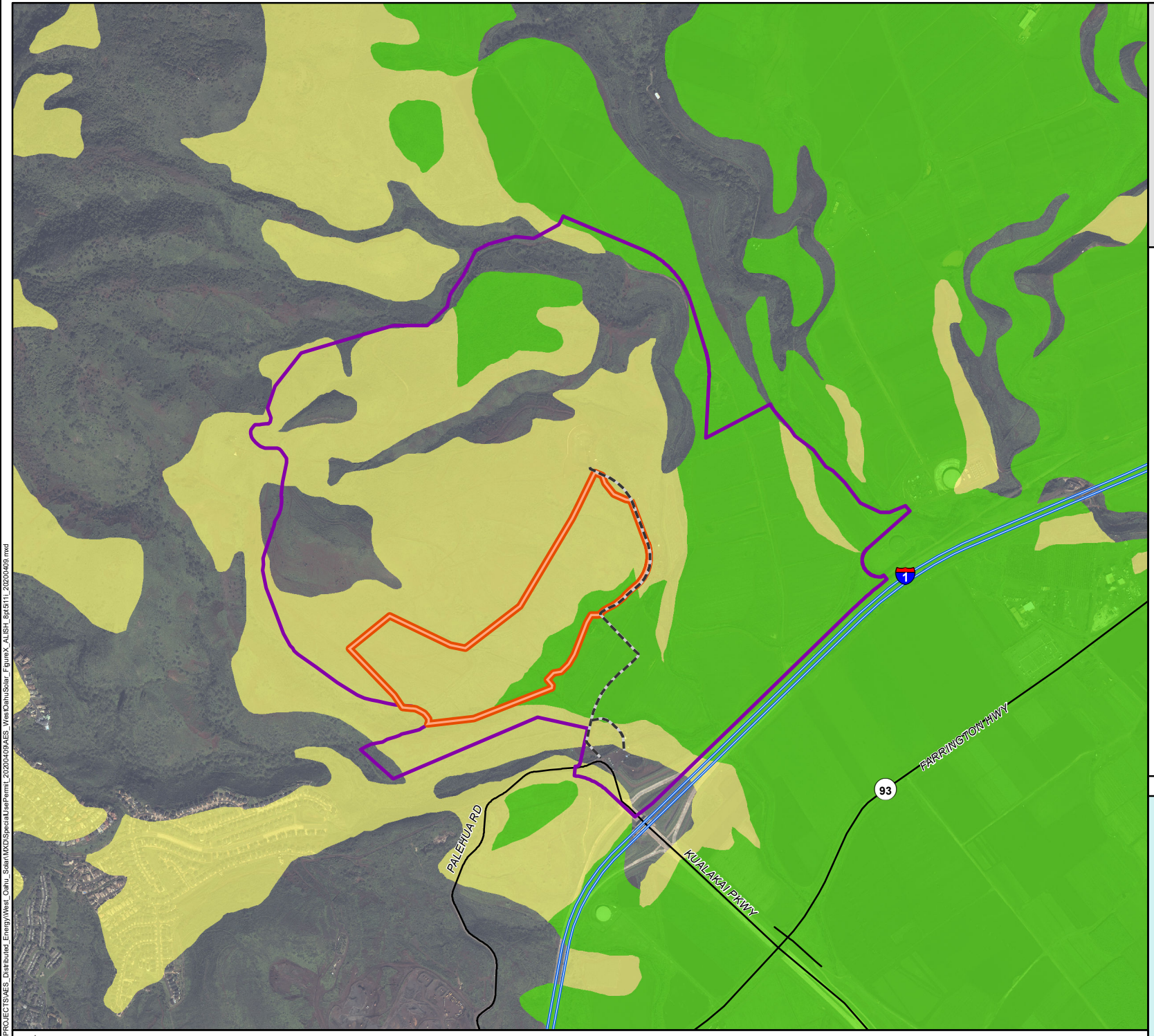

Figure 9

West Oahu Solar Plus Storage Project

AES Distributed Energy

Agricultural Lands of Statewide Importance

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway
- Prime Lands
- Other Lands

TETRA TECH

Reference Map

1:20,000 WGS 1984 UTM Zone 4N

0 0.25 0.5 1 Miles

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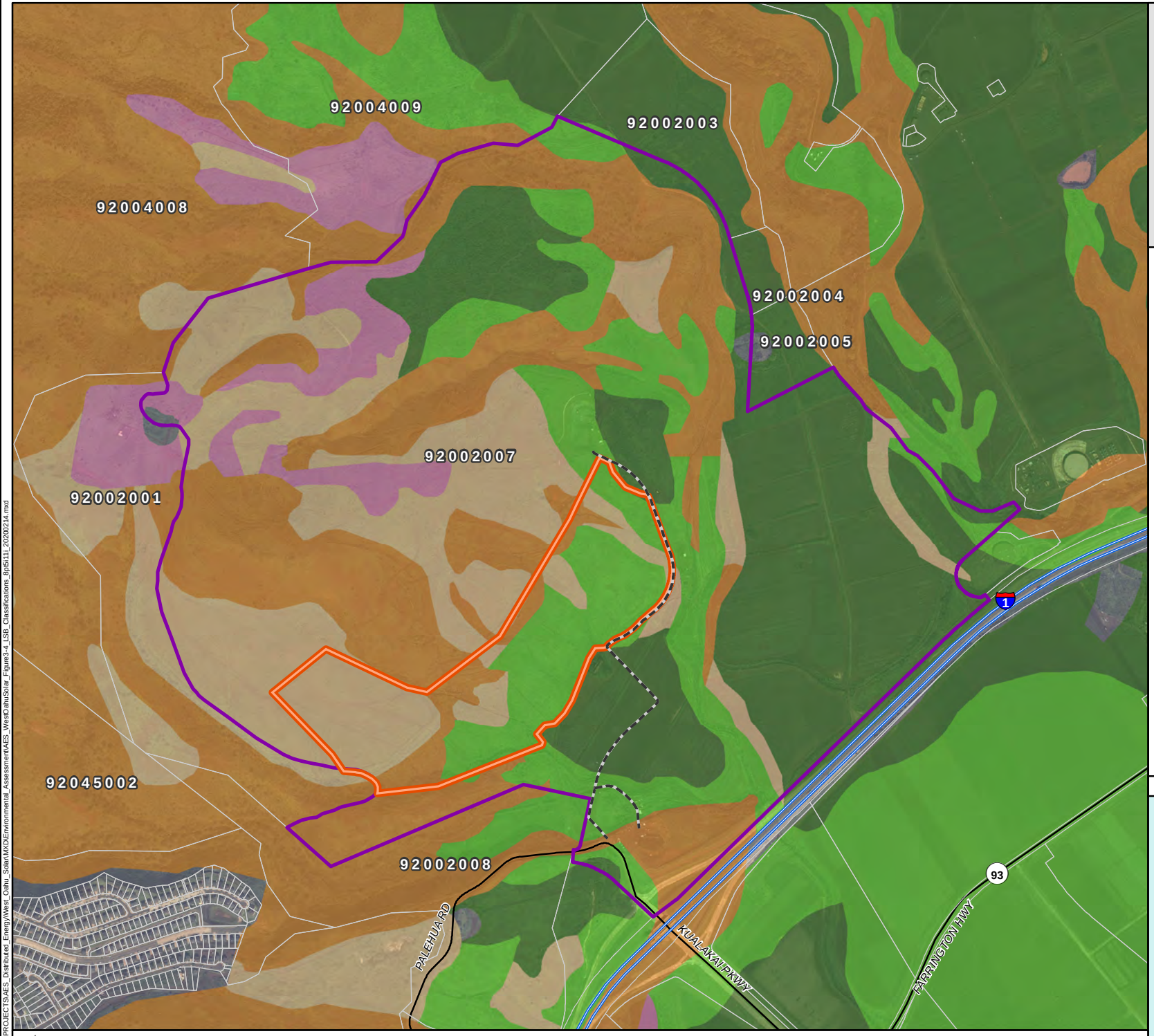

Figure 10

West Oahu Solar Plus Storage Project

AES Distributed Energy

Land Study Bureau Classification

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway

Land Study Bureau Classes

- A
- B
- C
- D
- E

TETRA TECH

Reference Map

1:15,000 WGS 1984 UTM Zone 4N

0 0.25 0.5 1 Miles

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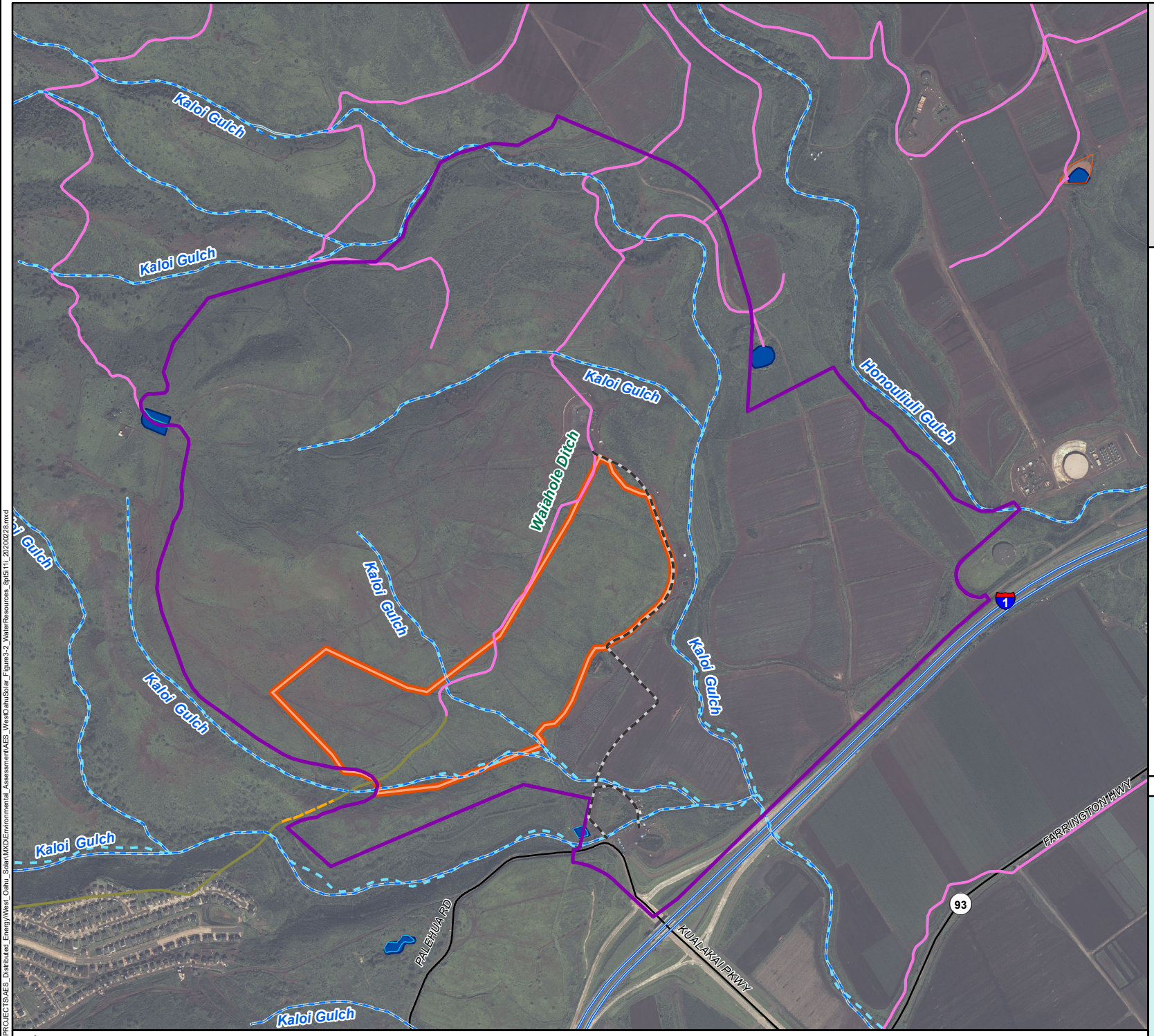

Figure 11

West Oahu Solar Plus Storage Project

AES Distributed Energy

Water Resources

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway
- Non-Perennial Stream (State of Hawaii Division of Aquatic Resources)

National Wetland Inventory

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

National Hydrography Dataset

- Waterbody
- Canal/Ditch
- Pipeline (Surface Aqueduct)
- Pipeline (Underground Aqueduct)
- Intermittent Stream

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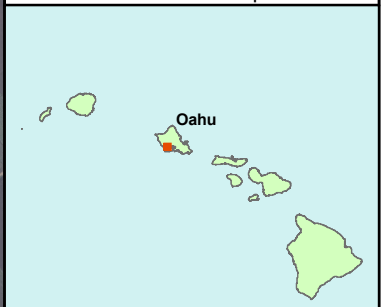

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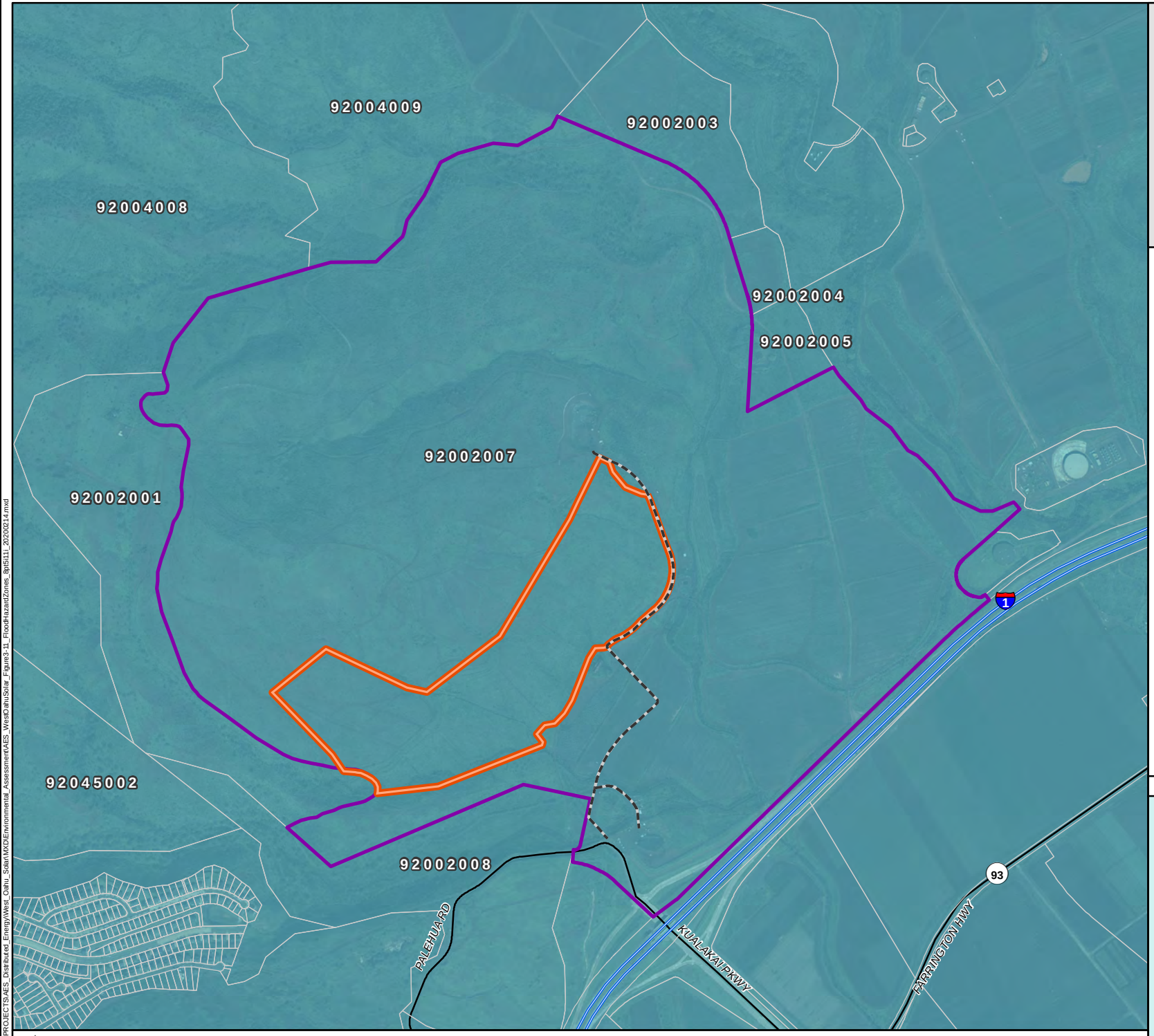

Figure 12

West Oahu Solar Plus Storage Project

AES Distributed Energy

Flood Hazard Zones

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway
- Flood Hazard Zone D (FEMA)

TETRA TECH

Reference Map

1:15,000 WGS 1984 UTM Zone 4N

0 0.25 0.5 1 Miles

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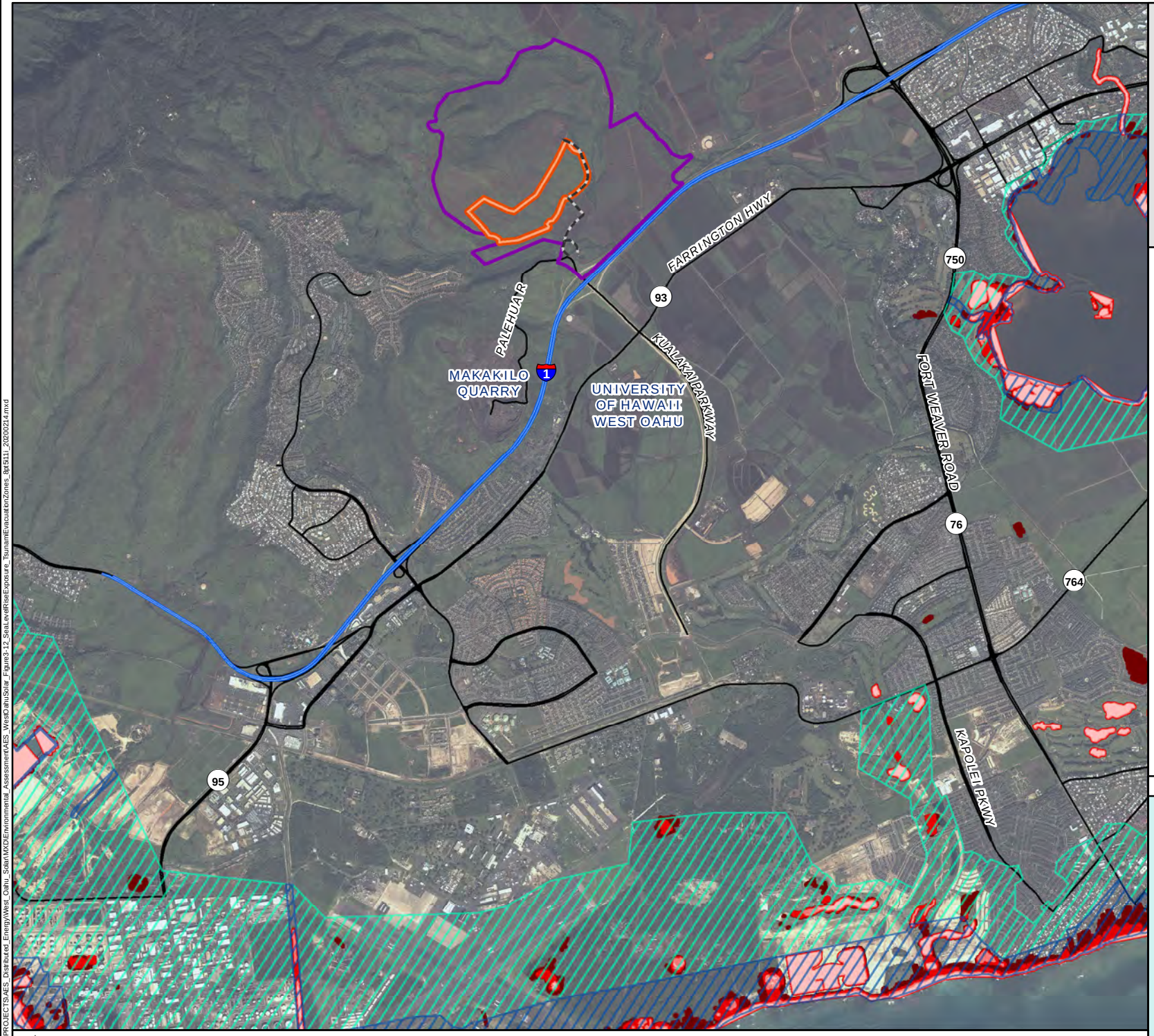

Figure 13

West Oahu Solar Plus Storage Project

AES Distributed Energy

Sea Level Rise Exposure and Tsunami Evacuation Zones

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway
- Extreme Tsunami Evacuation Zone
- Tsunami Evacuation Zone

Sea Level Rise Exposure Areas

- 0.5 feet
- 1.1 feet
- 2.0 feet
- 3.2 feet

TETRA TECH

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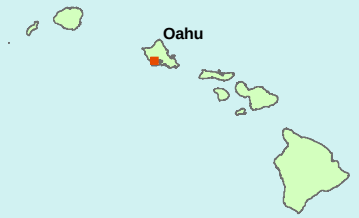

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0 0.25 0.5 1 Miles

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