NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY

An Authority of the State of Hawaii attached to the Department of Business, Economic Development & Tourism

September 13, 2024

MEMORANDUM

TO: Mary Alice Evans, Director
Environmental Review Program

FROM: Laurence Sombardier, Interim Executive Director
Natural Energy Laboratory of Hawai‘i Authority

SUBJECT: Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA/AFONSI)
Proposed Seawater-to-Jet Fuel Research & Development Project
North Kona District, Island of Hawai‘i
Tax Map Key: 7-3-043:081

With this memorandum, the Natural Energy Laboratory of Hawai‘i Authority (NELHA) transmits the subject Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA/AFONSI) for the Proposed Sea Dragon Energy, Inc. Seawater-to-Jet Fuel Research and Development Project for publication in the next available edition of *The Environmental Notice*.

The required publication forms and files, including an electronic copy of the DEA/AFONSI in pdf format, have been provided via ERP's online submission platform. As required by HAR § 11-200.1-5(e)(1)(B), paper copies of the DEA/AFONSI will be submitted to the Kailua-Kona Public Library and the Hawai‘i Documents Center.

Pursuant to HAR § 11-200.1-20(b), publication of the DEA/AFONSI in *The Environmental Notice* initiates a 30-day public comment period for the public to provide comments regarding potential effects of the proposed action. Public comments should be submitted to Planning Solutions, Inc., as detailed in the submittal form.

Should there be any questions, contact Alex Leonard at alexander.leonard@hawaii.gov or 808-292-5157.

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To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Friday, September 13, 2024 1:58:57 PM

Action Name

Sea Dragon Energy Seawater-to-Jet Fuel Research and Development Project

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

North Kona, Hawai‘i

Tax Map Key(s) (TMK(s))

(3) 7-3-043:081 (portion)

Action type

Applicant

Other required permits and approvals

None

Discretionary consent required

Lease agreement

Approving agency

Natural Energy Laboratory of Hawai‘i Authority

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Is there a consultant for this action?

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Action summary

Sea Dragon Energy, Inc. (SDEI) is proposing to use a site formerly occupied by a seawater bottler at NELHA's HOST Park to conduct research and development (R&D) on a seawater-to-jet fuel (SJF) process. The project site at HOST park is a portion of TMK No. 7-3-043:081 that includes a warehouse, parking area, and other infrastructure. The R&D unit, if successful, would inform the possible development of a larger mobile SJF unit. The R&D unit would produce roughly 10 gallons of jet fuel per month. No new buildings, substantial land disturbances, or substantial new outdoor equipment are proposed. SDEI would be responsible for decommissioning its equipment at the completion of the R&D period, which may range in duration from 2 to 5 years.

Reasons supporting determination

The Anticipated Finding of No Significant Impact is based on the analysis of significance criteria provided in Chapter 5 of the DEA/AFONSI.

Attached documents (signed agency letter & EA/EIS)

- 2024-09-23-HA-DEA-Sea-Dragon-Energy-SJF.pdf
- 2024-09-13_NELHAtoERP-SeaDragonDEArequest.pdf

Action location map

- Sea-Dragon-at-NELHA.zip

Authorized individual

Jim Hayes

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT, SEA DRAGON ENERGY SEAWATER-TO-JET FUEL RESEARCH AND DEVELOPMENT PROJECT

PREPARED FOR:

SEA DRAGON ENERGY, INC.

PREPARED BY:

PLANNING SOLUTIONS

SEPTEMBER 2024

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LIST OF ACRONYMS

AFONSI	Anticipated Finding of No Significant Impact
BMP	Best Management Practice
CAB	Clean Air Branch
CWRM	Commission on Water Resource Management
CZM	Coastal Zone Management
DEA	Draft Environmental Assessment
DLNR	Department of Land and Natural Resources
EA	Environmental Assessment
ECEM	Electrolytic Cation Exchange Module
EIS	Environmental Impact Statement
EMS	Emergency Medical Services
ERP	Environmental Review Program
ESA	Endangered Species Act
FEA	Final Environmental Assessment
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
gpm	Gallons Per Minute
HAR	Hawai‘i Administrative Rules
HCC	Hawai‘i County Code
HCCMAC	Hawai‘i Climate Change Mitigation and Adaptation Commission
HCFD	Hawai‘i County Fire Department

HCGP	Hawai‘i County General Plan
HDOH	State of Hawai‘i, Department of Health
HEPA	Hawai‘i Environmental Policy Act
HICRIS	Hawai‘i Cultural Resources Information System
HOST	Hawai‘i Ocean Science and Technology
HRS	Hawai‘i Revised Statutes
HSLR	Hawai‘i Sea Level Rise Vulnerability and Adaptation Report
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
KCDP	Kona Community Development Plan
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons per Day
NELH	Natural Energy Laboratory of Hawai‘i
NELHA	Natural Energy Laboratory of Hawai‘i Authority
NHO	Native Hawaiian Organizations
NOAA	National Oceanographic and Atmospheric Agency
NPDES	National Pollutant Discharge Elimination System
NRL	Naval Research Laboratory
ONR	Office of Naval Research
OTEC	Ocean Thermal Energy Conversion
PSI	Planning Solutions, Inc.
R&D	Research & Development
SDEI	Sea Dragon Energy, Inc.
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
SJF	Seawater-to-Jet Fuel
SLR	Sea Level Rise
SLR-XA	Sea Level Rise Exposure Area
SMA	Special Management Area
SPK	Synthetic Paraffinic Kerosene
TEN	The Environmental Notice
TMK	Tax Map Key
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 INTRODUCTION

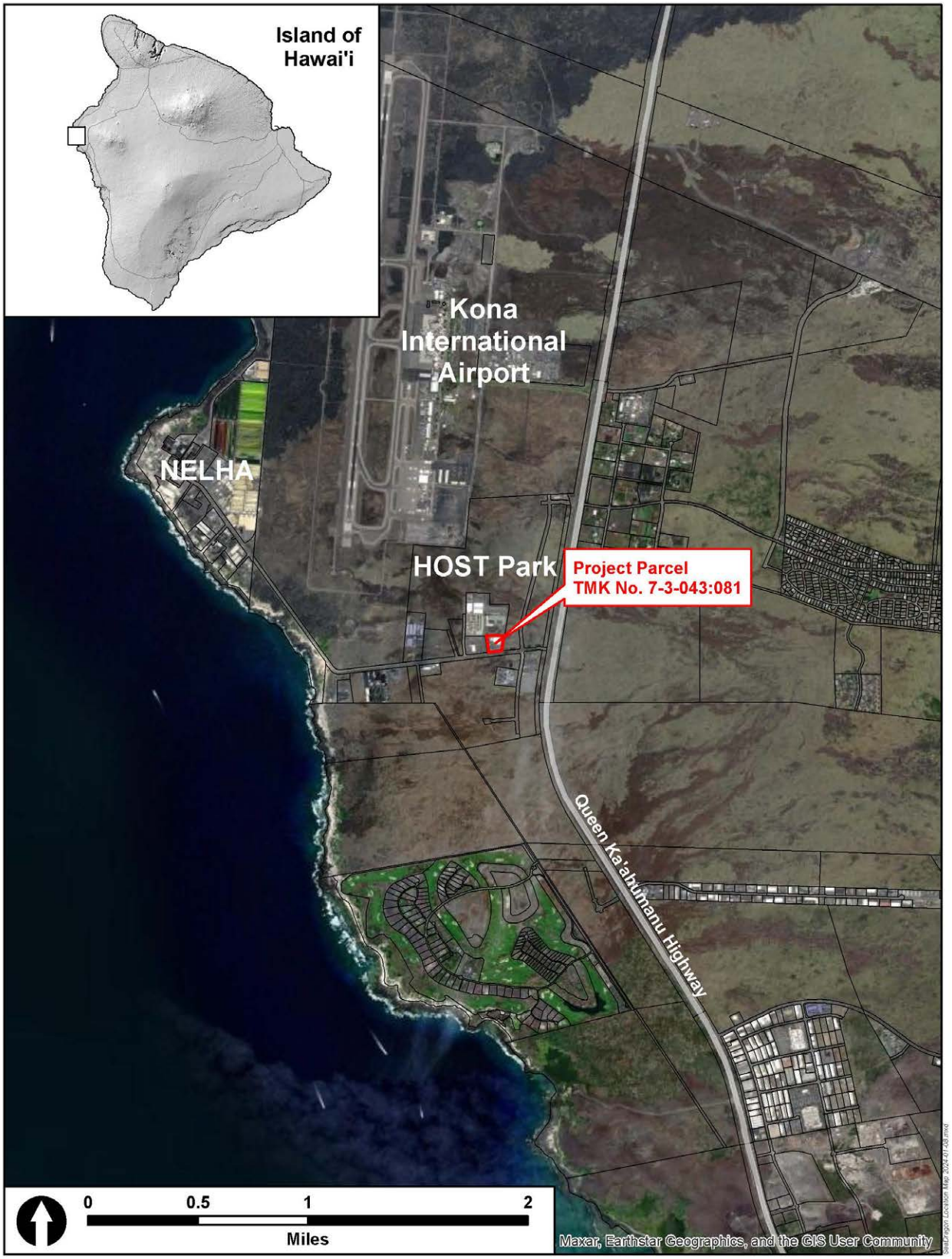
1.1 OVERVIEW

Sea Dragon Energy, Inc.'s (SDEI) mission is to contribute to meeting the energy demands of the future by creating technologies for mobile, on-demand production, storage, and consumption of energy. By decentralizing and distributing energy production and storage closer to energy users, these technologies are intended to increase resiliency, support sustained renewable generation growth, and help address the challenges of climate change. SDEI, working under contact with the Office of Naval Research (ONR), is testing the feasibility of integrating the Naval Research Laboratory's (NRL) electrolytic cation exchange module (ECEM) and other carbon capture technologies with gas-to-liquid technologies to create aviation turbine fuel in a process referred to as Seawater-to-Jet Fuel (SJF). The proposed project is intended to build upon prior experiments and feasibility studies to advance research and development (R&D) supporting scaleup of the SJF process.

SDEI is proposing to build and operate an SJF R&D unit at a site within the Natural Energy Laboratory of Hawai‘i Authority's (NELHA) Hawai‘i Ocean Science and Technology (HOST) Park (Figure 1-1 and Figure 1-2). The project parcel is Tax Map Key (TMK) 7-3-043:081, which has a street address of 73-188 Makako Bay Drive in Kailua-Kona, on the Island of Hawai‘i. The project parcel was previously used by a business engaged in the desalinization and bottling of NELHA's deep seawater and conducting research on health products derived from deep sea water. The parcel is developed with a warehouse, parking area, utilities, and other infrastructure. The warehouse, built in 2004, is roughly 24,800 square feet and includes some office space and laboratory space. It is in the State Land Use Urban District and is zoned a MG-3a General Industrial District by the County of Hawai‘i. The proposed project site, and all NELHA lands, is in the Special Management Area (SMA).

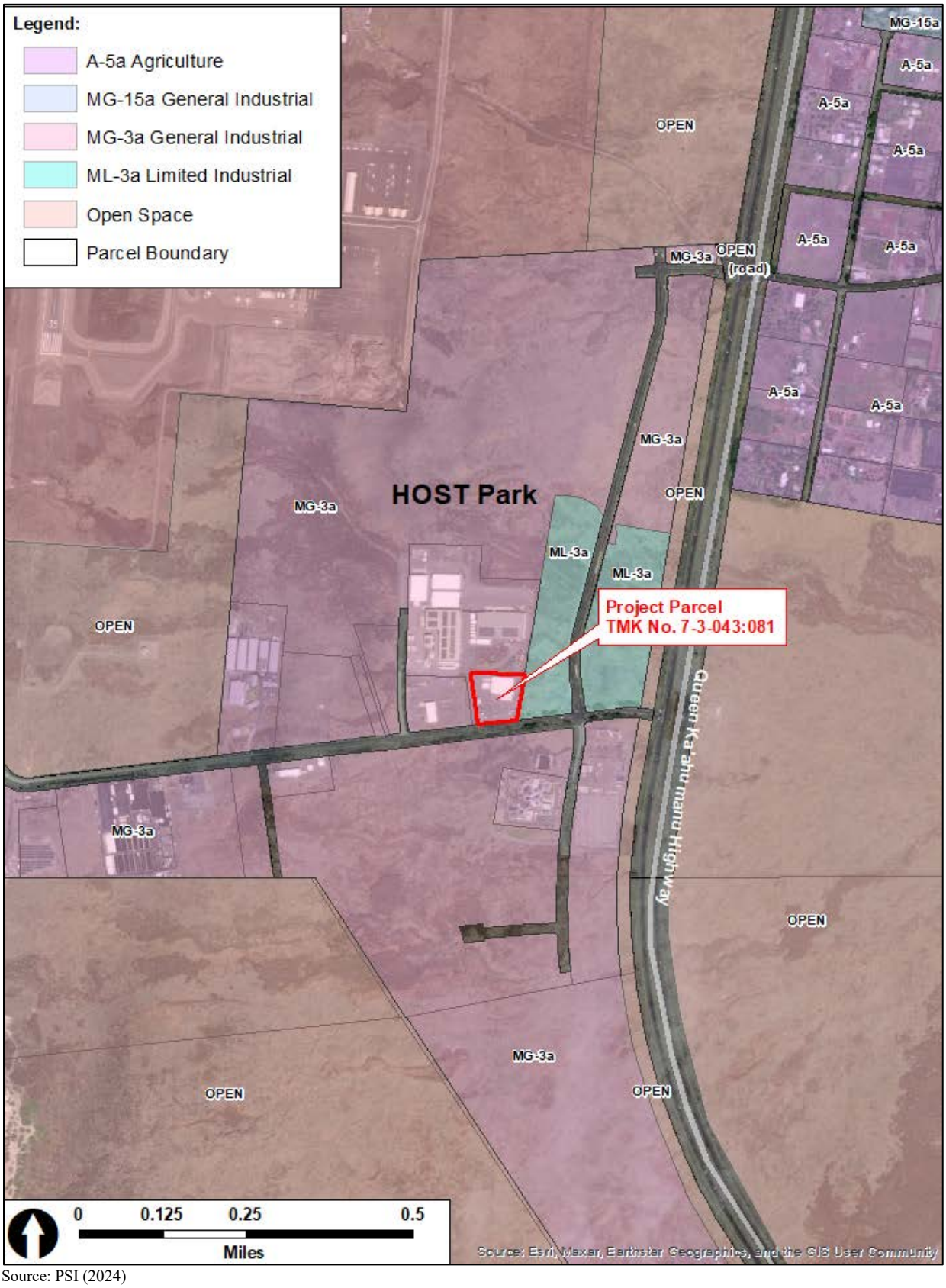
The proposed project would occupy a portion of the parcel. The "project site" is the portion of the parcel that would be leased by SDEI. SDEI would occupy some or all of the warehouse building and a portion of the western side of the outdoor area. NELHA would have the flexibility to seek additional tenants for the portion of the project parcel not leased to SDEI. No new buildings, substantial land disturbances, or substantial new outdoor equipment are proposed.

Figure 1-1: Location Map



Source: Planning Solutions, Inc. (2024)

Figure 1-2: Vicinity and Zoning Map



Source: PSI (2024)

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to inform the future development of a mobile SJF unit capable of producing greater quantities of jet fuel. The future development will be informed through the construction and operation of the proposed R&D unit. Another purpose of the Proposed Action is to provide jet fuel samples for testing. The samples will be analyzed to evaluate the quality of the jet fuel generated by the unit and inform possible unit modifications.

The Proposed Action is needed to create the appropriate conditions, in terms of scale and flexibility, that will allow SDEI to optimize the various methods and technologies involved and ultimately commercialize the technology. SDEI believes that decentralizing and distributing energy production and storage will increase resiliency, support sustained renewable generation growth, and help address the challenges of climate change through a range of potential applications in the private and public sectors.

The proposed project needs the following elements near each other:

- System inputs, including sea water, fresh water, electricity, and a source of hydrogen.
- A site, preferably one that already possesses easy access to most or all the system inputs at the needed levels and has buildings with sufficient space for the R&D unit.

1.3 ENVIRONMENTAL ASSESSMENT TRIGGER

Because the project is being proposed by SDEI, which is not a government agency, the plan is an "Applicant Action" under Hawai‘i Revised Statutes (HRS) Chapter 343 and Hawai‘i Administrative Rules (HAR) § 11-200.1. These regulations are collectively referred to as the Hawai‘i Environmental Policy Act (HEPA). Applicant Actions are only required to comply with HEPA if they meet both parts of a two-part test codified in HAR § 11-200.1-9. The two parts are that the project:

1. Requires one or more approvals defined as a "discretionary consent" by a governmental agency prior to implementation; and
2. Involves one or more triggers identified in HRS § 343-5(a), which includes item (1) Propose the use of state or county lands or the use of state or county funds."

The proposed project meets the first part of the test because it requires the NELHA board of directors to approve the issuance of a lease to SDEI. The other approvals required to implement the proposal are listed in Section 2.1.8. None of the other approvals meet the HEPA definition of a "discretionary consent." The second test is also met because the NELHA HOST Park land, including TMK 7-3-043:081, is owned by the state.

In this case, NELHA has determined that the preparation and processing of an Environmental Assessment (EA) is the appropriate method to comply with HEPA. The publication of this Draft EA (DEA) and Anticipated Finding of No Significant Impact (AFONSI) in the Office of Planning and Sustainable Development, Environmental Review Program's (ERP) bi-monthly bulletin, *The Environmental Notice*, initiates a 30-day public review and comment period. After the 30-day public review period is complete, all substantive comments will be considered and addressed in a Final Environmental Assessment (FEA).

2 PROPOSED ACTION AND ALTERNATIVES

HAR § 11-200.1 contains the State's environmental impact rules and content requirements. HAR § 11-200.1-9 defines the assessment process for "applicant actions;" among other things, it requires the applicant to address alternatives to the Proposed Action in an EA.

In accordance with those requirements, SDEI has considered various alternatives before choosing the proposed project as the appropriate course of action. This process consisted of: (*i*) defining the project's purpose and need, as described in Section 1.2; (*ii*) identifying possible alternative means of meeting that purpose; and (*iii*) evaluating each potential alternative with respect to the project's purpose and need. This chapter describes the process that was followed and the alternatives that were determined to be appropriate for evaluation in this EA.

2.1 DESCRIPTION OF THE PROPOSED ACTION

SDEI is proposing to build and operate an SJF R&D unit on a portion of TMK 7-3-043:081 within NELHA's HOST Park. The site has a street address of 73-188 Makako Bay Drive in Kailua-Kona on the Island of Hawai'i and was previously developed and occupied by a company engaged in bottling desalinated deep sea water and conducting research on health products derived from deep sea water. The proposed project would lease and use the western portion of the parcel, including some or all of the building erected by a previous tenant. The remainder of the parcel could be leased by NELHA to another entity.

The proposed R&D unit would be capable of producing 10 gallons of jet fuel per day if operated continuously. It would not operate continuously; the unit would operate in batches or "campaigns" so that variables could be systematically adjusted, equipment gradually improved, and R&D goals achieved. Each batch or campaign would last approximately 30 calendar days and result in the production of 10 gallons of jet fuel. This will result in the production of roughly 10 gallons of jet fuel per month, or 120 gallons annually. All unit processes and operations will also have the ability to be run concurrently over short periods of time while in "demonstration mode" so that each component can be tested, evaluated, and modified independently.

The R&D unit is intended to provide proof-of-concept. It is not intended for long duration use and is not intended to be used for production-scale manufacturing of jet fuel. It is solely intended to be a facility where R&D can be conducted with a focus on improving the critical technology elements involved.

The following subsections provide a brief description of the technology involved and, if SDEI obtains all the necessary permits and approvals, the steps it would take to implement the project.

2.1.1 OVERVIEW OF SJF PROCESS

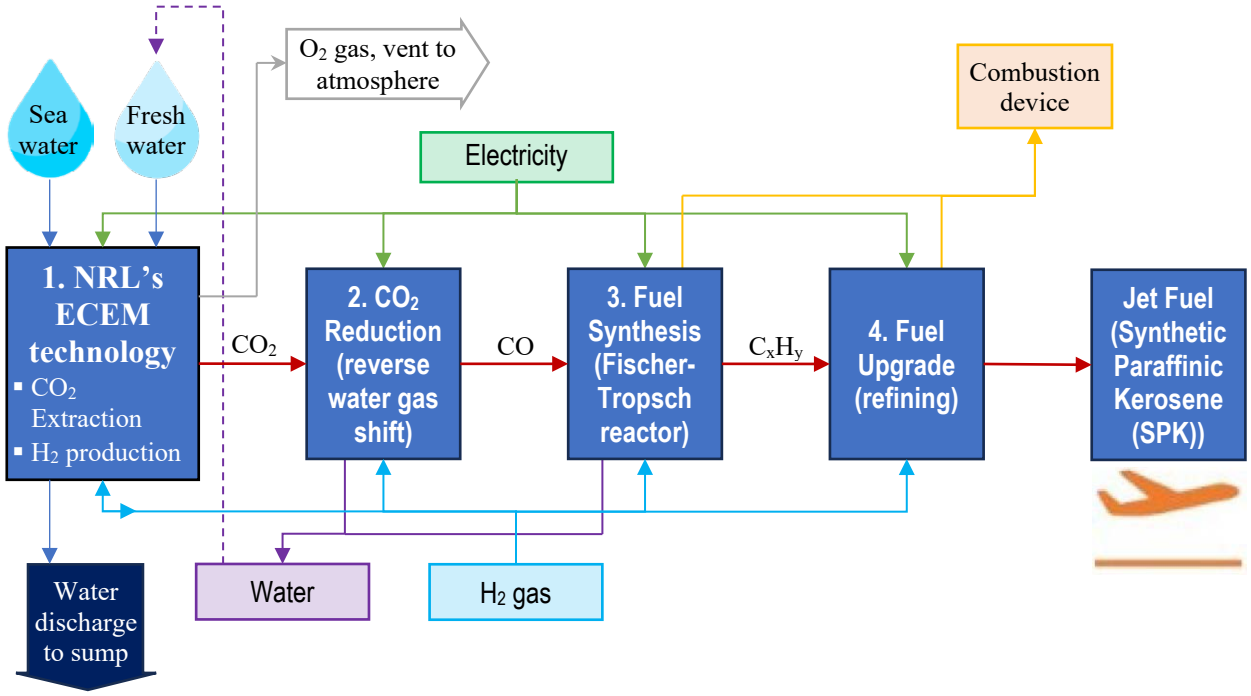
The R&D unit will produce jet fuel from seawater. The process of producing energy-rich liquid fuel from CO_2 extracted from seawater requires multiple processes and operations, where chemical and physical changes take place. The process can be broken down to several primary steps, which are described below and summarized in Figure 2-1. The process inputs and outputs are described below and summarized in Table 2-1.

1. Carbon capture using the proprietary ECEM module based on methods and technology originally developed by the NRL to support forward deployed Naval operations. Carbon capture technologies other than ECEM will also be tested. This step requires the following inputs:
    - Sea water, which would be obtained from NELHA's existing sea water infrastructure. An 8-inch-diameter sea water pipeline extends to the mauka side of the site's warehouse.
    - Fresh water, which would be obtained from NELHA's allocation from the Department of Water Supply. A fresh water pipeline extends to the mauka side of the site's warehouse.
    - Hydrogen gas (H_2), which may be obtained from the Hawai'i Natural Energy Institute's production facility at HOST Park or from an alternative commercial gas supplier. The gas would be delivered to the site in cylinders.
    - Electricity, which would be obtained from Hawaiian Electric. A transformer is present on the mauka side of the site's warehouse.

    The outputs from this step are:
    - Carbon Dioxide (CO_2) and H_2 gas would be captured and sent to the next step.
    - Water (H_2O, the same quantity as what was input), which would be a mix of sea water and fresh water. The water would not contain pollutants and would be discharged to the existing on-site sea water disposal sump.
    - Oxygen gas (O_2) as a byproduct would be vented to the atmosphere.
2. CO_2 Reduction (reverse water gas shift) to convert the CO_2 to carbon monoxide (CO). This step requires inputs of H_2 and electricity. The outputs are CO, which would be captured and sent to the next step, and water. The water would be captured and tested. It is assumed that the water will be similar in quality to tap water and can be recycled as shown in the diagram.
3. Fuel Synthesis (Fischer-Tropsch reactor) to convert the CO, with H_2, to synthetic hydrocarbons (a.k.a. Syncrude). This step utilizes metal catalysts and operates at various temperatures to produce hydrocarbons that are typically alkanes with a range of weights and, on average, have a composition similar to Dodecane ($C_{12}H_{26}$). Inputs to this process include CO (from the previous step), H_2, and electricity. Outputs are liquid hydrocarbons, that are captured and advanced to the next step, hydrocarbon vapors, and water. The vapors will be directed to the combustion device, currently planned to be a low flow flare. Like the CO_2 reduction step, the water would be captured and tested. It is assumed that the water will be similar in quality to tap water and can be recycled as shown in the diagram.
4. Fuel Upgrade to refine the alkanes to produce a fuel like jet fuel. The product is also known as synthetic paraffinic kerosene (SPK). This step is similar to what takes place at a conventional fuel refinery, except that it will be at a much smaller scale and the feed stock will enter the process much closer to the desired product than a conventional refinery producing fuel products from crude oil. The inputs to the process are the liquid hydrocarbons captured from the Fischer-Tropsch reactor, H_2, and electricity. The outputs are jet fuel (a.k.a. SPK) and hydrocarbon vapors that will be directed to the

combustion device. The jet fuel will be tested, stored indoors with spill protection, and not allowed to accumulate more than 120 gallons.

Figure 2-1: Overview of SJF Methodology



Note: Alternatives to the ECEM carbon capture technology will also be tested. The combustion device will most likely be a low flow flare.
Source: SDEI

Table 2-1: Anticipated Inputs and Outputs of the R&D Unit per Campaign

Stream Type	*Description*	*Approximate Quantity per Campaign*	*Source or Destination*
Input	Sea water	449,000 gallons	NELHA sea water system
Input	Fresh water	50,000 gallons	Department of Water Supply (alternatives being considered)
Input	Supplemental hydrogen gas (H_2)	70 kilograms (154 pounds)	Hawai'i Natural Energy Institute's production facility at HOST Park or an alternative commercial gas supplier
Discharge	Sea water	449,000 gallons	On-site sump
Discharge	Fresh water	50,000 gallons	On-site sump
Step 1 Byproduct	Hydrogen gas (H_2)	5 kilograms (11 pounds)	Used in downstream steps
Step 1 Byproduct	Oxygen gas (O_2)	5 kilograms (11 pounds)	Vent to atmosphere
Step 2 and 3 Byproduct	Water	80 gallons	Testing, followed by on-site recycling or off-site treatment and disposal
Step 3 and 4 Byproduct	Hydrocarbon gases	Equivalent to 1 gallon of fuel	Combusion device (low flow flare)
Product	Aviation turbine fuel	10 gallons	Quality testing, storage, & off-site use

Note: Each campaign will take roughly 30 calendar days.
Source: SDEI

As summarized in Table 2-1, the discharged sea water and fresh water from the ECEM and, depending on testing results, the water generated by the other steps, will be disposed of using the existing sump. H_2 dryer purges and light hydrocarbon gases will be sent to a combustion device, which will most likely be a low flow flare.

2.1.2 PORTION OF THE PARCEL TO BE UTILIZED

The project parcel, formerly used by a desalinated water bottler, is completely developed including a large paved outdoor area that surrounds a 24,800-square-foot building with warehouse space, administrative space, and laboratory space (Figure 1-2). The project site, the portion of the parcel to be used by and leased to SDEI will consist of the western portion of the exterior space and some or all of the building. Should some of the building be leased, the expected breakdown of space used by the proposed project includes: (*i*) 8,000 square feet of warehouse space, which is the western portion of the building; (*ii*) 3,000 square feet of administrative space also in the western portion of the building; and (*iii*) outdoor space adjacent to the western portion of the building, which will be used for loading and parking, plus a few minor pieces of outdoor equipment. Should the entire building leased to SDEI, the areas required would remain the same, but SDEI would be able to distribute its equipment more broadly within the building. Security fencing is provided around the entire 3-acre parcel. No new buildings, substantial land disturbances, or substantial new outdoor equipment are proposed.

Figure 2-2 provides an overview of the project parcel and project site. The extent of the project site will be determined in negotiation between SDEI and NELHA. The extent of the project site will remain entirely within the project parcel. Figure 2-3 provides photographs depicting the existing conditions on the project parcel.

2.1.3 SITE PREPARATION

As the space at site is fully developed and the building mostly empty, SDEI expects little demolition or earthwork will be necessary. The site does have some remnant equipment and piping from the previous tenant that may be utilized or will be disposed of or recycled off-site. Within the warehouse, where the bulk of the SDEI equipment will be situated, some minor modifications, such as installing equipment anchors, will need to be made. An interior partition will also be built so that another tenant can use the other portions of the warehouse. The exterior of the warehouse will not be modified. SDEI will perform some minor remodeling of the office space and laboratory.

SDEI anticipates that some minor external excavation may be required for foundations to support the flare and gas cylinder storage rack. The total quantity of excavated material is not expected to exceed 10 cubic yards.

Figure 2-2: Site Plan Showing Project Parcel and Project Site, if Some of the Building is Leased to SDEI

Source: PSI

Figure 2-3: Photographs of Existing Conditions on the Project Site

a. Exterior of site (south side).

b. View of warehouse interior.

c. View of laboratory space.

Source: SDEI

2.1.4 CONSTRUCTION

The great majority of all construction activities will occur within the warehouse and consist of installing and connecting various pieces of equipment. The equipment will be organized into modules that are referred to hereafter as "skids." The skids will include, for example, CO_2 reducing modules, ECEM modules, water filters, air compressor package, glycol chiller package, and electrical switchgear. Each skid will be manufactured and assembled off-site, on the mainland, and then shipped to the site for installation. By deploying each major component on skids, SDEI will limit the amount of on-site construction and installation activities required; the on-site construction activities will primarily be to anchor and connect the skids.

The only construction activities in the exterior portion of the site will consist of limited modifications to utility connections on the mauka side of the building, a hydrogen gas cylinder storage area, and a small flare. The flare will be mounted in the parking area in the northwest portion of the site; it will be roughly 20 feet tall.

SDEI's contractors will be tasked with any renovations of the office and laboratory space. SDEI will hire local contractors to do the construction, including work to connect the skids, to the extent possible.

2.1.5 OPERATIONS

SDEI envisions operating the R&D unit for a minimum period of two (2) years. During the operational period it is anticipated that five employees will be present on site – a site manager and 2-4 process operators. The employees will require skills common in the fuel refinery and processing industries. It is believed that these jobs can be filled locally because operations like Par Hawai‘i indicate that these types of workers are available in the state. As technological

advancements are realized during the R&D unit's operation, it is possible that SDEI will replace equipment with new and improved versions. The occasional maintenance and replacement of equipment may be required and result in brief periods when a greater number of workers are on site.

The R&D unit will be operated in two modes: (*i*) demonstration mode; and (*ii*) fuel production mode. Operations will commence by focusing on the "front end" of the operation, generating enough on-specification CO_2 and H_2 before moving on to the fuel synthesis section where synthetic hydrocarbon will be created and low, medium, and heavy Fischer-Tropsch liquids (Syncrude) are generated.

Once Syncrude is generated, operations will focus on running the upgrading section to produce SPK. The same upgrading section will operate in "aromatics mode" to generate enough aromatic hydrocarbons to blend with the SPK to meet fuel specifications. An entire campaign will take roughly 30 calendar days to complete and produce approximately 10 gallons of jet fuel. While both the demonstration and fuel production modes are priorities for SDEI, having the unit serve as a chassis for applied R&D to improve the critical technologies is equally critical. With that third objective in mind, operations will also have a distinct focus on executing trials of individual methods and technologies, as directed by SDEI's staff working in collaboration with the NRL and any other associated researchers. When the unit is in demonstration mode, SDEI and its subcontractors will assist in concurrent operation of the entire R&D unit; when not in demonstration mode but rather in fuel production mode, the unit will be run in semi-continuous "campaigns."

SDEI will be the administrator of the site and will have overall responsibility for operating the R&D unit safely and in compliance with applicable rules and the terms of their lease agreement. SDEI, the Executive Director of NELHA, and the NRL program sponsor will serve as a steering committee for this initiative.

2.1.6 DECOMMISSIONING

Once SDEI has realized the R&D value of the proposed project, it will be decommissioned and removed per the lease agreement with NELHA. The equipment will all be shut down, disconnected, cleaned, and transferred to appropriate off-site locations. SDEI and its contractors will be solely responsible for the decommissioning and removal of all equipment pursuant to the terms of their lease.

2.1.7 PROJECT SCHEDULE

SDEI currently anticipates that the proposed R&D unit will be in service in 2026. Table 2-2 summarizes the schedule, including this HRS Chapter 343 process.

Table 2-2: Estimated Project Schedule

Task	*Estimated Duration*	*Estimated Completion*
HRS Chapter 343 EA	9 months	November 2024
Lease and Permitting	4 months	April 2025
Procurement and Construction	13 months	May 2026

2.1.8 PERMITS AND APPROVALS REQUIRED

In addition to the completion of this HRS Chapter 343 EA and entering a lease agreement with NELHA, the project may require building and/or plumbing permits from the County of Hawai‘i, Planning Department or Public Works Department.

Although the project site is within the SMA, the County of Hawai‘i Planning Department has determined that "The project's proposed activities are consistent with the permitted uses of the MG district and the uses and activities authorized by the SMA permit [number 239]." The letter from the Planning Department is provided in Appendix A. SMA permit number 239 was obtained by NELHA and authorizes a wide range of uses consistent with NELHA's mission, which is discussed in Section 4.1.5.

2.1.9 PROJECT BUDGET

The budget required to develop the proposed project is approximately $16M, but may range from $12M to $20M, pending final design.

2.2 PROJECT ALTERNATIVES

HAR § 11-200.1 contains the environmental review rules. HAR § 11-200.1-18 establishes the process for the preparation and content of an EA. Among the requirements listed, HAR § 11-200.1-18(d)(7) requires the identification and analysis of impacts and alternatives considered.

In accordance with those requirements, SDEI has and continues to consider alternatives. The process consisted of formally defining the purpose and need for the project (Section 1.2) and then identifying other ways in which those objectives might be achieved (i.e., alternatives, including those specifically recommended by HRS 343 and HAR 11-200.1). Possible alternatives considered include the no action alternative, alternative locations, alternative configurations, alternative scales, and alternative timing (i.e., delayed action).

Certain types of alternatives were eliminated from consideration early in the process by SDEI because, although their consideration is part of the HRS 343 process, they are not suitable to the Proposed Action. An alternative scale or configuration was not considered because the purpose of the project is R&D, not production, and the project fits within a small space. Delaying the action was not considered because delaying R&D would delay future commercialization of the technology, which could help address urgent needs associated alternative energy production and climate change. Alternative locations in Hawai‘i were not considered because NELHA's HOST Park possesses a unique set of the resources needed to conduct the R&D project. For these reasons, no viable alternatives were identified that could address the project's purpose and need.

The only alternatives analyzed in this EA are the proposed project, as defined in Section 2.1, and the no action alternative. The no action alternative consists of not implementing the Proposed Action described in Section 2.1 or any other action in Hawai‘i to address the purpose and need. SDEI would neither lease the project site nor would it develop an R&D unit there. Further, the no action alternative would not support the Sea Dragon Energy Project's purpose and need. Under the no action alternative, the project site would remain in its current developed condition. SDEI has concluded that the no action alternative is not a viable alternative. It is included in this EA to fulfill the content recommendations of HRS, Chapter 343 and HAR § 11-200.1. It also provides a baseline against which to measure the potential environmental and social impacts of the Proposed Action.

3 EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION

This chapter describes the potential environmental effects of the Proposed Action and the No Action Alternative, as described in Chapter 2. This chapter is organized by resource category (e.g., natural hazards, archaeological and cultural resources, etc.). The discussion under each topic includes: (*i*) an overview of existing conditions at the site or its vicinity; (*ii*) the potential environmental impacts that may occur because of implementation of the alternatives considered in this EA; and, where appropriate, (*iii*) any measures that SDEI proposes to avoid, minimize, or mitigate potential adverse effects.

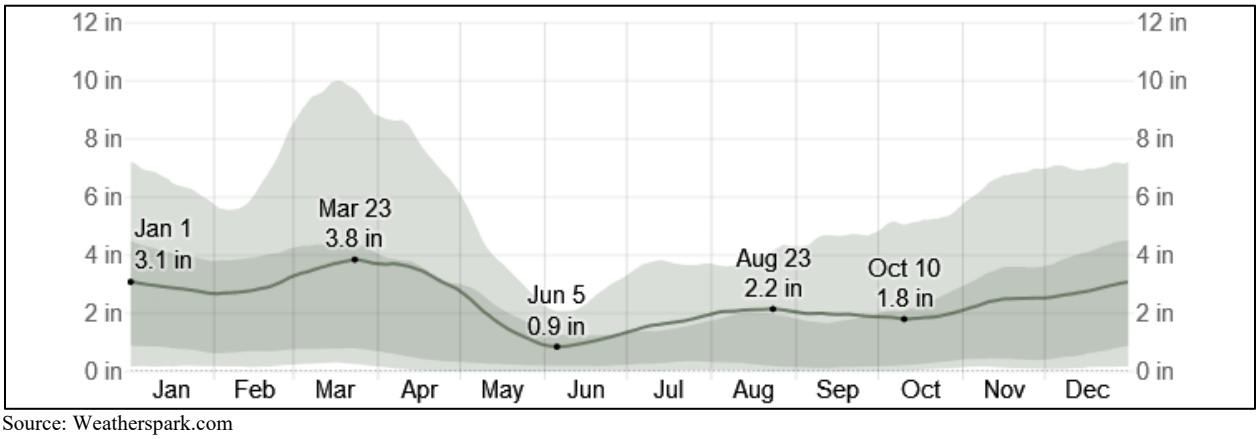
The scale of the discussion is commensurate with the potential for impacts and public interest as informed by scoping input received. Where appropriate, the larger environmental context (i.e., the North Kona region) is discussed, and in other cases the focus is narrower (i.e., the project site). The discussion of impacts also distinguishes between short-term (i.e., those occurring when construction equipment and personnel are actively implementing demolition and/or construction processes) and long-term (i.e., those that may occur during the operational phase of the project).

3.1 CLIMATE AND PRECIPITATION

3.1.1 EXISTING ENVIRONMENT

Located within the Kekaha region of North Kona, at an approximate elevation of 70 feet above sea level, the principle environmental features of the project area are a hot, arid climate, with extensive lava fields and little to no soil accumulation. Rainfall occurs throughout the year at Ellison Onizuka Kona International Airport at Keāhole (henceforth, "Kona International Airport"), directly adjacent to HOST Park and the closest point for which continuous climate data is available. The month with the most rain is March, with an average rainfall of 3.7 inches. The month with the least rain is June, with an average rainfall of 1.0 inches. Figure 3-1 summarizes average monthly rainfall at Kona International Airport.

Figure 3-1: Average Monthly Rainfall at Kona International Airport

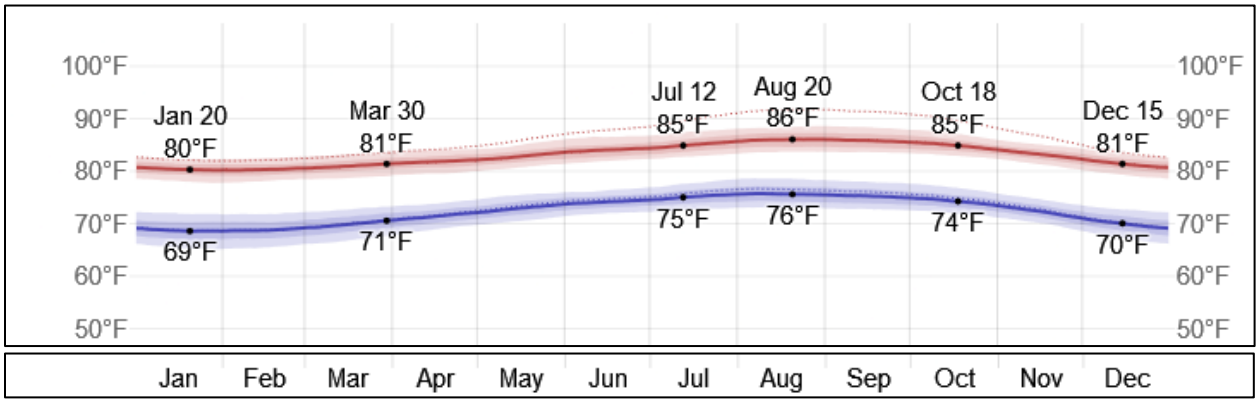


Source: Weatherspark.com

The climate at Kona International Airport is warm, muggy, and partly cloudy. Over the course of the year, the temperature typically varies from 69°F to 86°F and is rarely below 65°F or above

89°F. Average temperatures at Kona International Airport vary only minimally throughout the year and cannot be meaningfully divided into hot and cold seasons. Figure 3-2 summarizes the average high and low temperatures throughout the year.

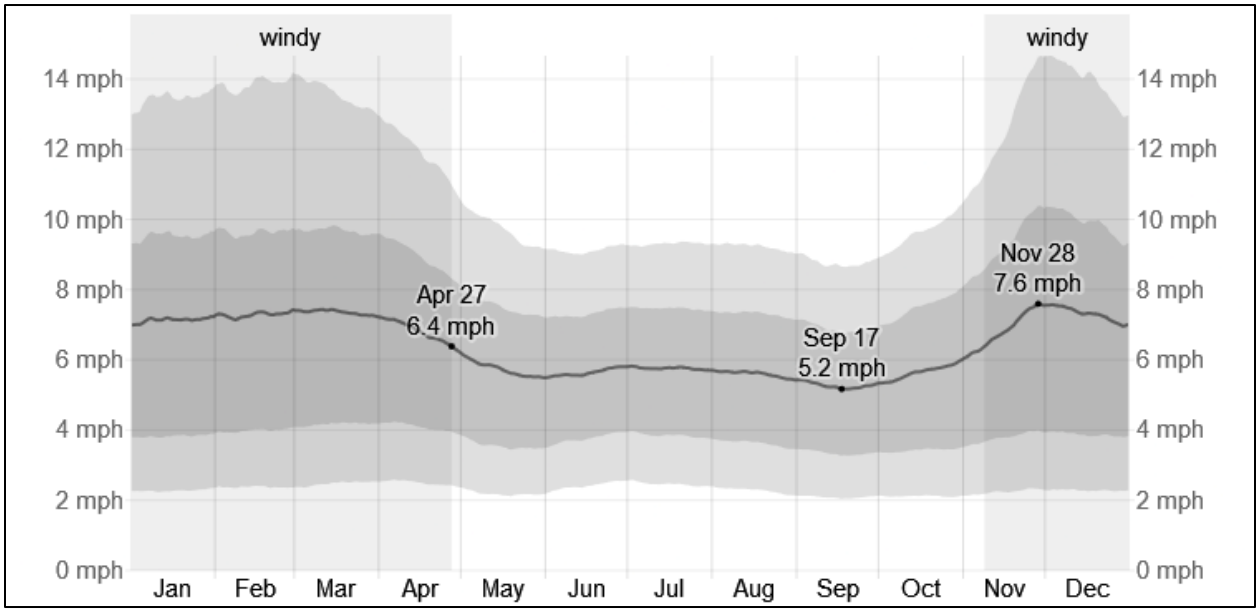
Figure 3-2: Average High and Low Temperature at Kona International Airport



Source: Weatherspark.com

The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. The average hourly wind speed at Kona International Airport experiences mild seasonal variation over the course of the year. During the windier half of the year, from approximately November through April, the average wind speed is 6.4 miles per hour (mph); the windiest month of the year at Kona International Airport is March, with an average windspeed of 7.4 mph. The calmer part of the year, extending from approximately May through October, and the calmest month of the year is September, with an average hourly wind speed of 5.3 mph. Figure 3-3 summarizes average wind speed at Kona International Airport.

Figure 3-3: Average Wind Speed at Kona International Airport



Note: Based on wide-area hourly average wind speed at 10 meters above the ground.
Source: Weatherspark.com

Climate variability and climate change can exacerbate and facilitate impacts from other hazards such as hurricanes, tropical storms, flooding, sea level change, and drought. These hazards are discussed in Section 3.7.

3.1.1 POTENTIAL IMPACTS

The Proposed Action does not include short-term or long-term uses or activities on a scale that have the potential to adversely affect local climate conditions.

Similarly, the No Action Alternative would not affect local climate conditions.

3.2 AIR QUALITY

3.2.1 EXISTING ENVIRONMENT

Air quality in the region is good; all federal and state air quality standards have been attained. There are no State of Hawai‘i Department of Health (HDOH) air monitoring stations in the immediate vicinity of the project site. The nearest HDOH monitoring station is located on Konawaena School Road, approximately 18 miles south of the project site. Air pollution in West Hawai‘i is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that can persistently blanket North and South Kona, depending on the volume of gas emissions from Kilauea and/or Mauna Loa volcanoes. Minor levels of air pollution also come from urban uses including traffic, the airport, and industrial activities in the region.

The HDOH Clean Air Branch (CAB) manages the air monitoring stations, publishes reports regarding air quality, and issues various permits related to point source air emissions. HAR 11-60.1-62 addresses the applicability of the most likely air quality permit required by the proposed project, a noncovered source permit. HAR 11-60.1-62(d) lists air pollutant sources that are exempt from this type of permit. The list includes “(1) Stationary sources with potential emissions of less than: (A) 500 pounds per year for each hazardous air pollutant, except lead; (B) 300 pounds per year for lead; (C) five tons per year of carbon monoxide; (D) 3,500 tons per year CO_2e for greenhouse gases; and (E) two tons per year of each regulated air pollutant not already identified above.”

3.2.2 POTENTIAL IMPACTS

The SDEI R&D unit processes are discussed in Section 2.1.1 and illustrated in Figure 2-1. The only steps that will generate air pollutants are the third and fourth steps, the fuel synthesis (Fischer-Tropsch reactor) step and the fuel upgrade step, respectively. All potential air pollutants will pass through and be treated by a combustion device, which is currently planned to be a low flow flare.

The carbon source is entirely CO_2 gas, either obtained from seawater or obtained from a commercial source. The only combustion device and the only device generating air pollutants would be the low flow flare. Two emission estimates are provided below. Section 3.2.2.1 estimates the emissions if the R&D unit is operated at double its planned rate. This is considered an upper limit for actual project emissions. Because the HAR 11-60.1-62(d) thresholds are based

on continuous operation, Section 3.2.2.2 provides hypothetical annual emission rates if the R&D unit was operated continuous, which it would not be designed to do.

3.2.2.1 Emissions Estimate – Anticipated Level of Use

To derive a conservative upper-limit estimate for the emissions that could be generated by the project, we start by assuming that the R&D unit would be operated in a manner that could produce at least double the quantity of jet fuel planned. This upper limit estimated assumes that up to 60 gallons of synthetic hydrocarbons will be sent to the refinery (step 4 in Figure 2-1) per month, or 720 gallons per year.

The R&D unit's emissions are estimated using EPA AP-42 Air Emissions Factors and Quantification guidance for flares in a petroleum industry setting. This is the method recommended by the HDOH CAB. Table 3-1summarizes the calculations using an annual feed of 720 gallons, which is roughly 2,726 liters. This emissions estimate does not include lead because there is no lead input to the SDEI system.

Table 3-1: Emissions Estimate Using EPA AP-42 Guidance, Anticipated Operation

Air Pollutant	*EPA AP-42 Emission Rate*	*SDEI Annual Feed*	*SDEI Annual Emission*	*SDEI Annual Emission*	*HAR 11-60.1-62(d) Exemption Annual Emissions Limit*
Units:	*Kg/1000L*	*1000L*	*Kg*	*Ton*	*Ton*
SOx	0.077	2.726	0.21	0.00023	2.0
CO	0.012	2.726	0.033	3.61E-05	5.0
Hydrocarbons	0.002	2.726	0.0055	6.01E-06	0.25
NOx	0.054	2.726	0.15	0.00016	2.0

Source: PSI.

Table 3-1 shows that the proposed project emissions are well below the exemption limits in HAR 11-60.1-62(d). In fact, it is estimated that the SDEI annual feed would need to increase by nearly 4 orders of magnitude to exceed any of the exemption limits.

To put the emissions in context, the emissions associated with sending 72 gallons (450 pounds) of hydrocarbons to the low flow flare per year is similar to the emissions generated by driving a typical automobile about 1,870 miles. Or, since the proposed project is producing jet fuel and is near the airport, the 72 gallons of hydrocarbons sent to the low flow flare per year is roughly equivalent to the amount of fuel consumed by a Boeing 717 (the plane most commonly operating at neighboring Kona International Airport) in 5 minutes.

3.2.2.2 Emissions Estimate – Continuous Operation

The thresholds defined in HAR 11-60.1-62(d) are based on 8,760 hours/year of unit operation (continuous operation). Therefore, this section estimates project emissions if the R&D unit were to operate continuously, which it will not be capable of doing but is provided as a theoretical exercise so that the HDOH CAB can fully assess whether the project requires a permit. It is estimated that if operated continuously, 20 gallons of feed stock would be sent to the refinery per 24 hours period, or 7,300 gallons per year. This is an order of magnitude increase over the

operation described in the previous sections. Table 3-2 summarizes the emissions under the continuous operation scenario.

Table 3-2: Emissions Estimate Using EPA AP-42 Guidance, Continuous Operation

Air Pollutant	*EPA AP-42 Emission Rate*	*SDEI Annual Feed*	*SDEI Annual Emission*	*SDEI Annual Emission*	*HAR 11-60.1-62(d) Exemption Annual Emissions Limit*
Units:	*Kg/1000L*	*1000L*	*Kg*	*Ton*	*Ton*
SOx	0.077	27.63	2.13	0.0023	2.0
CO	0.012	27.63	0.33	3.61E-04	5.0
Hydrocarbons	0.002	27.63	0.055	6.01E-05	0.25
NOx	0.054	27.63	1.5	0.0016	2.0

Source: PSI.

3.2.2.3 Permit Determination

The information above was provided to HDOH CAB for their evaluation. In a letter dated August 12, 2024 (Appendix A), CAB concurred that the project is exempt, as defined in HAR 11-60.1-62(d), from air permitting requirements. This is because the emissions under the continuous operation scenario are well below the exemption limits in HAR 11-60.1-62(d). In fact, the annual feed would need to increase by nearly another 3 orders of magnitude to exceed any of the exemption limits.

3.2.3 AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES

SDEI will comply with all applicable provisions of HAR Chapter 11-60.1. To reduce the potential for adverse impacts to air quality SDEI will maintain all its equipment per manufacturer recommendations and regularly monitor areas where volatile chemicals and fuels are stored. Most importantly, the low flow flare will be monitored to ensure proper operation during each R&D campaign. Not more than 120 gallons of jet fuel or hydrocarbon intermediates will be allowed to accumulate at the project site.

3.3 GEOLOGY AND SOIL

3.3.1 EXISTING ENVIRONMENT

The project site is on the southwestern slope of the Hualālai, a dormant volcano that rises to an elevation of 8,271 feet above sea level. The slopes of Hualālai consist of a veneer of geologically young (i.e., 1,000-13,000 years old) lava flows, composed primarily of alkali olivine basalts characteristic of the late stages of its eruptive activity (Macdonald, Abbott, and Peterson; 1983). The alkali veneer is largely un-dissected by erosion, although some local gullying has occurred on the older flows. The oldest surfaces on Hualālai are found in the Kailua-Kona vicinity and also in the vicinity of Puʻu Waʻawaʻa, to the northeast. Hualālai's youngest rocks are the 1800-1801 lava flows which erupted north of the project site from the Northwest Rift Zone.

The project site has an approximate elevation of 70 feet above mean sea level. The geologic substrate on most of the project site is classified by the U.S. Natural Resources Conservation Service a mixture of (rLW) pāhoehoe lava flows on the north and west sides of the lot and (rLV) ʻaʻā lava on the southern and eastern side of the site. Both lava classifications typically exhibit practically no soil covering and are bare of vegetation, except for mosses, lichens, ferns, and a few small shrubs and trees. In the dry Kekaha climate, soil has not yet had time to form (U.S. Soil Conservation Service 1973). The lava flows have no agricultural value, and the project site has not been designated as a Land of Importance to the State of Hawaiʻi ("ALISH") nor is it identified on Hawaiʻi Department of Agriculture's maps of Important Agricultural Lands.

3.3.2 POTENTIAL IMPACTS

As the project site is fully developed the lava flows at the site have been substantially altered. SDEI expects little demolition or earthwork and no modification to the extent of development at the site. SDEI anticipates that some minor external excavation may be required to build foundations for a few components of the project. The total quantity of excavated material is estimated to be less than 10 cubic yards.

Ground disturbance associated with project construction would temporarily increase the potential for sediment discharge compared to the existing condition. Those short-term activities do not have the capacity to adversely affect geology or soil in a significant way; the impacts would have a limited extent, be temporary, and not affect soils that are important for agriculture.

The No Action Alternative would not involve any activities that have the capacity to affect soil or geologic conditions.

3.3.3 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Due to the limited scope of development, SDEI does not anticipate seeking a grading permit or a National Pollutant Discharge Elimination System (NPDES) permit. The project shall comply with all applicable state and county water quality standards. SDEI will obtain all required permits and approvals prior to performing the work and all staff/contractors will be required to comply with permit conditions.

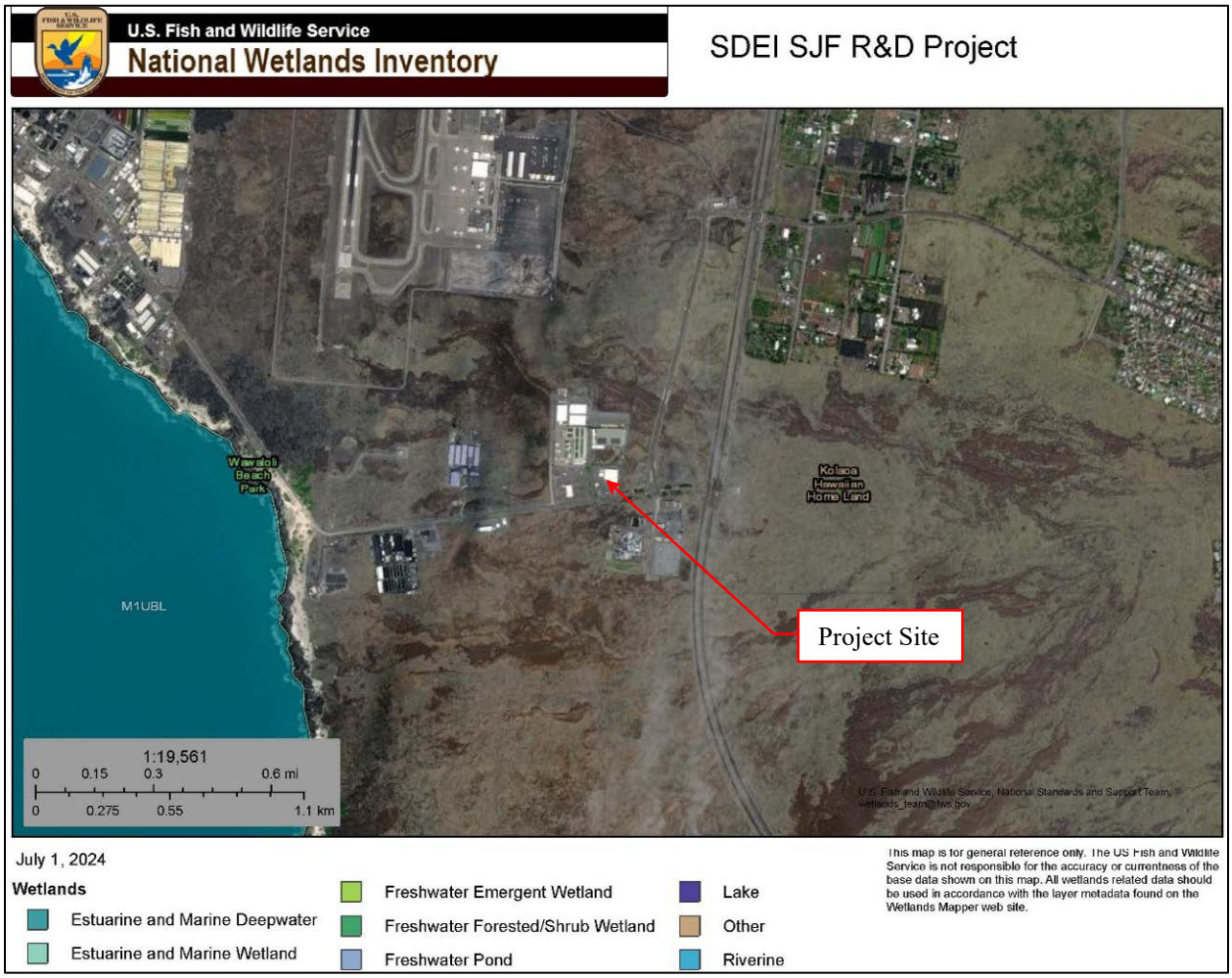
3.4 WATER RESOURCES AND AQUATIC BIOLOGICAL RESOURCES

3.4.1 EXISTING CONDITIONS

3.4.1.1 Surface Waters

Wetlands include surface waters like streams and the ocean. They also include wetlands like taro loʻi and other features. Figure 3-4 illustrates the surface waters and wetlands in the project area as mapped in the National Wetlands Inventory by the U.S. Fish and Wildlife Service (USFWS).

Figure 3-4: USFWS National Wetlands Inventory Map



Source: https://www.fws.gov/wetlands/data/mapper.html, accessed July 1, 2024.

The proposed project site is on an arid lava field and there are no wetlands nearby. The only classified wetland in the vicinity of the project site is the Pacific Ocean which is identified as Estuarine and Marine Deepwater located over half a mile west of the project site (Figure 3-4).

3.4.1.2 Groundwater

The Keauhou Aquifer System comprises the southern half of the Hualālai Hydrologic Sector, which is defined by the exposed rocks of Hualālai Volcano (Mink and Lau 1993).[1] The Keauhou Aquifer extends over the western and southwestern flank of Hualālai and the entire coastline from Mahaiʻula to Keikiwaha Point (Figure 3-5). Having been delineated prior to the discovery of high-level groundwater, the Keauhou Aquifer was described as a basal water system in the coastal area with the possibility of having high-level, dike-confined groundwater near the rift zones of Hualālai. The sustainable yield of the Keauhou Aquifer System is estimated to be 38 million gallons per day

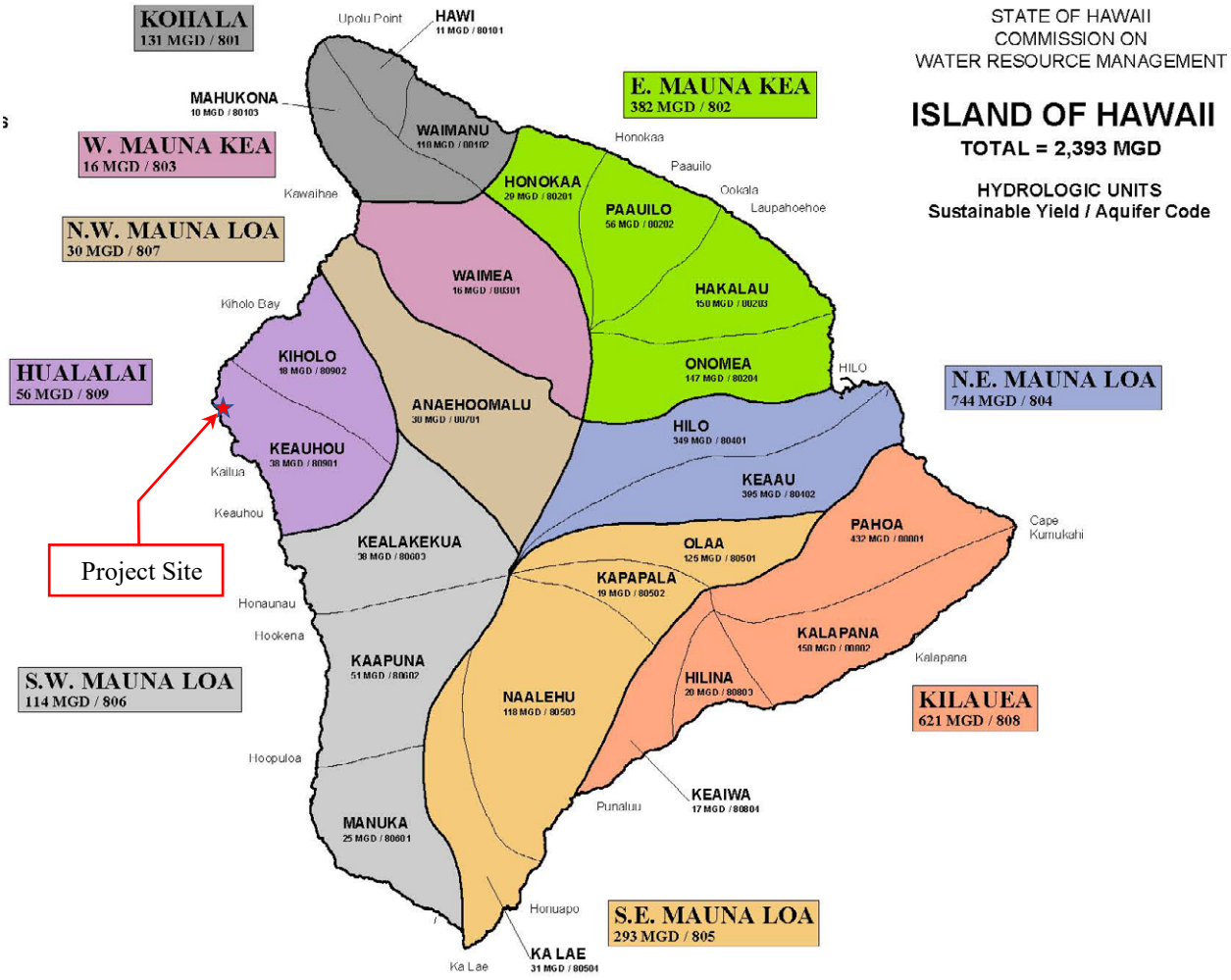
[1] A Hydrologic Sector reflects an area with broad hydrogeological (subsurface) similarities while maintaining traditional hydrographic (surface), topographic, and historical boundaries. An aquifer system is an area within a Hydrologic Sector that is more specifically defined by hydrological and geological continuity among aquifers in the system.

(MGD), based on a recharge estimate of 87 MGD and assuming that the groundwater occurs as an unconfined basal lens.

Natural groundwater recharge in the HOST Park area is from rainfall. The recharge area for the Keauhou Aquifer System is assumed to consist of essentially the surface area contained within the boundaries of the aquifer system. As estimated by Commission on Water Resource Management (CWRM), groundwater recharge is limited to the contribution of rainfall within the unit; the estimated recharge does not include potential inflow from adjacent units or the contribution of fog drip in the upper forests, which studies have been determined to be a considerable amount.

An unconfined basal lens underlies the coastal region of western Hawai‘i from Keāhole northward to beyond Kawaihae and southward to beyond Keauhou. Near NELHA, the lens is brackish, likely less than 125 feet thick and discharges in a narrow band a few feet wide in the intertidal zone. West of the project site at Keāhole Point, brackish water discharges are diffuse and not usually visible along the shoreline. The coastal part of the lens experiences appreciable ocean tidal influence (NELHA 2011).

Figure 3-5: Groundwater Hydrologic Units on Hawai‘i Island



Source: https://files.hawaii.gov/dlnr/cwrm/maps/gwhu_hawaii.pdf accessed June 2024.

In the HOST Park area there are other sources of groundwater recharge. The principle non-rainfall source of groundwater recharge is the disposal of sea water by NELHA tenants via seepage pits (sumps) and leach fields. Recently, roughly 17,000 gallons per minute (gpm) of sea water was being disposed of in this manner. Most of the discharge occurs in the NELHA area near the shoreline at Keāhole Point, but there are some discharges in the HOST Park area as well. The only other source of groundwater recharge in the area is associated with landscape irrigation. Based on the limited extent of irrigated landscape at HOST Park, irrigation water is not believed to be a significant contributor to groundwater.

3.4.1.3 Anchialine and Marine Water Resources

The HDOH classifies coastal waters off Keāhole Point as Class AA waters. According to HAR § 11-54-03(c)(1), Class AA waters are:

> *"High quality waters are those in which water quality is expected to exceed that necessary to support oceanographic research, propagation of aquatic communities and wildlife, compatible recreation and aesthetic enjoyment. It is the objective of class AA waters that these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions. To the extent practicable, the wilderness character of these areas shall be protected."*

Anchialine ponds are land-locked bodies of water lacking surface connection to the ocean, but with measurable salinities and dampened tidal fluctuations. The West Hawai‘i coast harbors most of the anchialine ponds in the state. Two clusters of ponds have been identified on NELHA property: (*i*) a northern complex of approximately five pools is situated north of the NELHA Research Campus inland of the cobble beach at Ho‘ona Bay; and (*ii*) a southern complex of ten pools north of the HOST Park access road and approximately 650 feet mauka of shoreline of Wāwāloli Beach Park (NELHA 2020). There are no anchialine ponds on the project site and the nearest ponds are more than 3,200 feet away.

NELHA has a system that provides seawater to HOST Park tenants. That system has deep (2,000 to 3,000 feet deep) and "surface" (30 to 80 feet deep) intakes offshore and a pipeline and pump network on shore. The average seawater pumped is roughly 20,000 gpm. HOST Park tenants are charged for their use of sea water; the rate includes a base rate and a surcharge indexed to the price of electricity.

3.4.1.4 Ongoing Environmental Monitoring of Water Quality and Aquatic Species

Starting in 1982, and gradually improved since, a comprehensive monitoring program has been implemented to ensure the NELHA infrastructure and activities do not detrimentally affect the health and productivity of aquatic environments. NELHA has conducted annual surveys and prepared extensive reports that are publicly available at NELHA's website (https://nelha.hawaii.gov/resources/library/nelha-lab-reports/). The most recently prepared reports are the *NELHA Benthic and Biota Monitoring Program, Annual Survey Report – 2023*, dated December 13, 2022 [sic] (https://nelha.hawaii.gov/wp-content/uploads/2023/12/NELHA_Report_12152023.pdf) and the *Annual Report for the Comprehensive Environmental Monitoring Program, Covering the Period: July 24, 1982, through*

June 30, 2023, dated November 2023 (https://nelha.hawaii.gov/wp-content/uploads/2023/11/1982-2023_NELHA_CEMP_REPORT_20231127.pdf).

These extensive reports provide details regarding water quality and aquatic species. Because the nearest surface water is more than 3,200 feet away from the project site, the information in these reports is only briefly summarized here. Generally, the monitoring programs have found:

- In the anchialine ponds the native red shrimp, ʻōpaeʻula (*Halocaridina rubra*), were found in most of the ponds in 2023. ʻŌpaeʻula was present in low numbers in ponds where introduced/invasive fish were present. Invasive algae species were not observed in any of the ponds in 2023. Observations suggest that the water quality conditions can sustain a community of native species.
- Marine surveys are conducted at six stations along the coastline adjacent to the NELHA facilities. At each station, 50-meter long transects are conducted at depth gradients of roughly 15, 30, and 50 feet of salt water, for total of 18 transects.
    - The benthic surveys reported a gradual increase in coral cover over the first 20 years (1989 through 2009) and a stabilization since then. The coral cover has stabilized in the range of approximately 30 to 50 percent with corals in the genus *Porites* being the dominant species among all stations and depths. The overall coral cover for 2023 was 39.9 percent, which is within this range and shows the benthic communities to have exhibited relatively consistent values of coral cover for the last ten years.
    - Fish data exhibit inherent variability due to high mobility and spatial habitat ranges of the nearshore species. The results from the monitoring program have been variable throughout its duration. The findings from 2023 show similar values of abundance, diversity, and biomass to 2022. Data from the 34-year duration of the monitoring program shows the nearshore habitats surrounding NELHA support highly diverse and productive fish assemblages.
- Chlorophyll-a, a measure of phytoplankton biomass, has never exceeded the HDOH limit. This is significant because (*i*) the HDOH limit in the Class AA ocean waters is conservative (low) to protect important waters; and (*ii*) the planktonic biomass would likely be among the first biological indicators of anthropogenic nutrients that could cause an adverse effect.
- Marine water chemistry observations are unchanged since NELHA's nearshore water quality monitoring inception in 1993.
- Groundwater monitoring, which now involves sampling at 34 wells, shows that groundwater chemistry has been comparatively constant over the past 35 years with intermittent anthropogenic nutrient enrichments and associated recoveries.
- The sea water disposal monitoring program commenced in 2011 and, on a quarterly basis, examines approximately 57 nonpoint sea water disposal locations at HOST Park. These locations are primarily seepage pits (sumps) and leach fields that are regulated under HAR Title 11, Chapter 62. The 57 disposal locations account for sea discharges of more than 17,000 gpm, which is only 3,000 gpm less than the sea water pumped by NELHA. One of the discharge locations "D1" is located on the project parcel; it is the

sea water disposal sump on the mauka side of the warehouse. Records indicate that, when in operation (up to mid-2017), roughly 200 gallons of water were discharged to on-site location D1 daily. Another discharge location is on the adjacent site to the north operated by Koyo USA Corporation (Koyo); records show that recently Koyo has been discharging roughly 310,000 gallons of sea water per day, or 215 gpm.

The conclusion of the multifaceted NELHA monitoring program is that the activities and uses at HOST Park have not had a detrimental impact on the resources monitored, including groundwater quality, surface water (anchialine ponds) quality, sea water quality, or the biological communities in those aquatic environments.

The recent results of NELHA's monitoring efforts are similar to other West Hawai'i marine water quality monitoring programs. This suggests that the water quality near NELHA is consistent with water quality elsewhere in the region, further suggesting that the activities at NELHA are not having a local adverse effect on the environment.

3.4.2 POTENTIAL IMPACTS

Construction of the Sea Dragon Energy Project will require only minimal quantities of water and will not have any appreciable impact on area fresh water, groundwater, anchialine, or marine water resources. There are no surface water bodies or anchialine ponds within the project site.

During normal operation of the R&D unit both fresh water and sea water will be utilized. As presented in Table 2-1, the project will require an estimated input of approximately 50,000 gallons of fresh water and 449,000 gallons of sea water per campaign. Each campaign is anticipated to last roughly 30 calendar days. During the portion of the campaign when sea water is needed, the flow of sea water will be roughly 25 to 50 gpm. During specific tests, peak demand for sea water may be up to 100 gpm.

In dialogue with NELHA, SDEI has determined that the demand for fresh water by the proposed project can be met by HOST Park's existing water allocation from the County of Hawai'i's Department of Water Supply. NELHA is working closely with SDEI to determine whether any alterations to the on-site sea water supply infrastructure will be needed; because there is an 8-inch-diameter sea water pipe at the site it is not anticipated that any alterations will be necessary to supply sea water at the required rate. The project's monthly use of sea water is expected to be lower than the previous tenant's.

The fresh and sea water that is used by the project will be combined and disposed of using the on-site sump. The effluent from the R&D unit will be roughly 1 part fresh water and 9 parts sea water, will have most of the CO_2 that was dissolved in it removed. No impurities, for example, nutrients, organic compounds, or chemicals, will be added to the water before or after it flows through the R&D unit. The R&D unit will not have a substantial effect on the process water pH or salinity. The effluent water will be directed to the sump at the rear warehouse. It will be discharged at a rate of roughly 55.6 gpm. The discharge will be limited to a specific period during the 30-day campaign so that the discharge lasts roughly six days per month. If the discharge was metered out across a 30-day period, it would be discharged at a rate of roughly 11.5 gpm or 16,600 gallons per day.

Based on long-term monitoring by NELHA, the pH of the sea water will be roughly 7.6 or 8.2 and its salinity will be 34.4 or 34.7 PSU, depending on if it comes from the deep or shallow source, respectively. The pH of the fresh water is anticipated to be roughly 8.2 and its chloride level will be roughly 150 ppm. Based on NELHA's monitoring of well W1 near/upgradient of the project site, the pH of the shallow groundwater beneath the project site is roughly 7.7 and its salinity is roughly 10.8 PSU. Because roughly 10 percent of the water discharged will be fresh water, the pH of the effluent is anticipated to be roughly 8 and its salinity will be roughly 31 PSU. Because the discharged water will have a salinity nearly triple that of the shallow groundwater, it will be denser than the shallow groundwater. It is anticipated it will penetrate through the groundwater column until it encounters groundwater with a similar salinity/density. NELHA's monitoring of well cluster 9, which is between the project site and the shoreline (downgradient), indicates that groundwater salinity increases with depth and the salinity is typically 23 PSU roughly 54 feet deep in the groundwater column (groundwater at an elevation of -54 feet). This suggests that the project effluent will sink through the groundwater column to a depth exceeding 54 feet.

Most discharges to the sumps at HOST Park have salinities consistent with pure sea water at rates much greater than the proposed project's discharge and do not result in adverse effect on the environment. Discharges with salinities of 22 and 23 PSU, one of which had a discharge rate higher than the proposed project's, have also occurred and resulted in no apparent adverse effects. Therefore, the proposed project's discharge with a salinity only slightly less than pure sea water at a rate of 500,000 gallons per month (16,000 gallons per day, on average) is not anticipated to have an adverse effect on groundwater quality.

Based on the foregoing, no significant adverse impacts to area water resources or aquatic species are anticipated due to the proposed project.

The No Action Alternative does not involve any construction or operational activities at HOST Park or any other location and does not have the potential to impact surface, ground, anchialine, or marine water resources in any way.

3.4.3 AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES

SDEI understands the fresh water limitations in West Hawai‘i. Based on the concerns voiced by the community during the scoping process, SDEI has worked to identify ways to reduce its use of fresh water. Initially, SDEI estimated approximately 136,000 gallons of fresh water would be required per campaign. SDEI now estimates that only roughly 50,000 gallons of fresh water will be required per campaign. SDEI will continue to seek ways to reduce its use of fresh water from the Department of Water Supply. This will include evaluating and, if possible, implementing recycling of its process water and considering alternative fresh water sources (such as desalination).

3.5 TERRESTRIAL AND AVIAN BIOLOGICAL RESOURCES AND PROTECTED SPECIES

Because the project site is completely developed and no substantial modification to the natural environment is being considered as part of the Proposed Action, no site-specific biological studies have been prepared for the Sea Dragon Energy Project. However, a substantial amount of

information is available as a result of nearby planning efforts, including within HOST Park, which has been used to consider the potential for impacts to biological resources which might result from the Proposed Action or the No Action Alternative. Those reports include:

- Terry, Ron (2022). *Biological Report, NELHA Innovation Center and Hale Wāwāloli, TMKs (3rd.) 7-3-043:051 and 088, North Kona District, Island of Hawai'i*, prepared for NELHA by Geometrician Associates, LLC. Kea'au, Hawai'i.
- NELHA (2020). *Annual Report for the Comprehensive Environmental Monitoring Program Covering the period: July 24, 1982, through June 30, 2020*. Kailua-Kona, Hawai'i.
- NELHA (2014). *Final Environmental Assessment, Natural Energy Laboratory of Hawai'i Authority, Connections to Queen Ka'ahumanu Highway and Kona International Airport at Keāhole, Island of Hawai'i, Hawai'i*. Kailua-Kona, Hawai'i.
- NELHA (2011). *Master Plan for Natural Energy Laboratory of Hawai'i Authority*. Kailua-Kona, Hawai'i.

In addition, and to better understand and assess the potential for biological impacts as a result of implementation of the Proposed Action, project planners also consulted the USFWS' Information for Planning and Consultation (IPaC) assessment tool. The primary information provided by an IPaC report is the known or expected range of each species. Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. The complete IPaC report for the Sea Dragon Energy Project is included in this report as Appendix B.

3.5.1 EXISTING CONDITIONS

As shown in Figure 2-3, the project site is completely developed, with little or no area which has not been developed with structures or hardscape. During a site visit in 2024, no vegetation or wildlife was observed in the portion of the site to be utilized by SDEI.

In May 2011, an inspection conducted by Dr. Ron Terry at NELHA found vegetation typical of that found by other studies on coastal Kona lava flows. The most abundant species are the non-native fountain grass along with the common indigenous herb 'uhaloa. A notable feature at HOST Park is the presence of the native shrub maiapilo (Geometrician Associates 2011). The only fauna observed at the project site have been common, introduced avian species, such as Common Myna and Spottled Dove.

In 2014, a survey for the Blackburn's sphinx moth, an arthropod listed under the state and federal endangered species statutes (USFWS, 2000), was conducted by Dr. Steven Montgomery and Anita Manning of AECOS, Inc. for the planned roadway corridors for the NELHA HOST Park. The survey found no evidence of the moth or its larval host plants.

In 2022, a survey for biological resources was conducted by Dr. Ron Terry of Geometrician Associates for NELHA's Innovation Center and Hale Wāwāloli Visitor Center located near the shoreline and in the coastal dry shrubland between the shoreline and Queen Ka'ahumanu Highway. The survey indicated the inland portions are mostly barren lava with areas that have been disturbed which support fountain grass and other weeds. Except for the endemic maiapilo, all the native

species detected are very common in the area, on the island, and throughout the Hawaiian Islands (Terry, 2021).

No plant or avian species listed under the federal Endangered Species Act (ESA), listed under HRS Chapter 195D, or protected by the Migratory Bird Treaty Act (MBTA) were observed during previous surveys in the area. No listed waterbirds, seabirds, migratory shorebirds, Hawaiian hoary bat, or Blackburn's sphinx moth were observed. Although not observed, it is possible that native forest birds and/or Hawaiian hoary bats are periodically present in the project area, and it is possible that seabirds overfly the project area during certain times of the year. There is no USFWS-designated critical habitat in the project vicinity.

According to the USFWS IPaC report, the following birds may be present in the region and potentially be affected by activities in this location: (*i*) Band-rumped Storm-petrel; (*ii*) Hawaiian Goose; (*iii*) Hawaiian Coot; (*iv*) Hawaiian Duck; (*v*) Hawaiian Petrel; (*vi*) Hawaiian Stilt; and (*vii*) Newell's Shearwater. The only mammal mentioned in the IPaC report was the Hawaiian hoary bat. The only reptile mentioned is the Hawksbill Sea Turtle, however the shoreline is more than half a mile away from the project site. The only insect mentioned is the Blackburn's Sphinx Moth. Finally, the following native plants may be present in the region and potentially affected by activities in this location: (*i*) ihi; (*ii*) koʻokoʻolau; and (*iii*) ohai. As noted above, none of these species were noted during previous surveys. Blackburn's sphinx moth and shorebirds are not known to occur in the project area. Historically, none of these species have been seen at the project site. Hawaiian Stilts are occasionally observed near the surface water ponds at HOST Park tenant Cyanotech's facility near the shoreline, which is over a mile west of the project site.

3.5.2 POTENTIAL IMPACTS

The proposed project site has already been developed and previously in use for many years. The proposed project would not result in new buildings, substantial land disturbances (less than 10 cubic yards), or substantial new outdoor equipment (a few items shorter than existing structures). The proposed project does not involve aquaculture or the keeping of any animals. The project site will be operated and maintained in a manner that limits the possibility for the introduction of invasive species and manages the availability of food for invasive species such as rats, cats, and goats. Trash, especially discarded food and drink, will be placed in secure rubbish receptacles that are regularly emptied. Wildlife feeding will not be allowed.

The proposed project would not change any wildlife habitat or remove any vegetation. No new exterior lighting is planned. The only exterior equipment with the potential to generate light will be the flare. The flare will be a low flow flare set at the top of a 20-foot-tall stack. At the top of the stack will be an ignition chamber with a direct spark igniter that will spark every 3 seconds to ignite waste gas. The flare will be equipped with a smokeless package. Given the low gas flow rate associated with the R&D unit and characteristics of the flare, it is anticipated that the flare will not appear to be a concentrated light source but may put off a dim glow that will likely only be visible at night. Gas flow that ignites at the flare will only occur during certain portions of each campaign, including process upsets, startup activities, and shutdown activities. If the flare is being used during nighttime hours, the light it produces will be diffuse and have a much lower intensity than nearby street/security lighting and airport lighting. Therefore, the flare is not anticipated to generate harmful light attraction for avian or insect wildlife.

An example of the low flow flare is provided in Figure 3-6. As that photograph illustrates, the flare is powered by a photovoltaic panel and is secured by three guy wires. At a height of 20 feet, which is roughly half the height of the on-site warehouse, the flare components are not anticipated to be a collision hazard for avian wildlife.

Figure 3-6: Low Flow Flare

Source: Hero Flare.

The Proposed Action would not result in material changes to the non-native predator or habitat degradation threats that protected species face. Unless managed using the avoidance and minimization measures outlined in Section 3.5.3, the Proposed Action has a very limited potential to impact certain biological resources protected by the ESA, HRS 195D, and/or MBTA in ways not directly associated with habitat loss/degradation or predation. Those potential impacts could occur in the short-term or long-term and are as follows:

- Seabirds, that may occasionally overfly the project area, could become disoriented by exterior lights. Once disoriented the birds may become exhausted and "fallout," which means they land or collide with an object and fall to the ground as they become exhausted. They can die from collisions or during interactions with mammals on the ground. The possibility of impact would be greatest during the seabird fledging season from September 15 through December 15 because the juvenile fledglings are more susceptible to light attraction than adult birds.
- During construction or maintenance activities, Blackburn's sphinx moth could be susceptible to light attraction especially to large work lights used at night.

Under the Proposed Action, with the implementation of the avoidance and minimization measures outlined below, the potential for impacts to these species would be substantially decreased so that no "take" of these species would occur. The impact would be less than significant.

The No Action Alternative would not involve any new construction and would not affect any listed species or the habitat upon which they rely.

3.5.3 AVOIDANCE, MINIMIZATION, OR MITIGATION MEASURES

The following measures would be implemented to avoid and minimize potential impacts to biological resources:

- Invasive Species:
  - Materials delivered to the project site, such as the skids assembled on the mainland, will be inspected for the presence of soil or invasive species when received. Inspections will continue as materials are unpacked to ensure that soil and invasive species are not hidden among the packing material. Any foreign material or invasive species will be immediately quarantined and/or treated.
  - Wildlife feeding (e.g., feeding feral cats or goats) will not be allowed.
  - All food waste will be placed in secure rubbish receptacles that are emptied regularly so that it is not accessible to rodents or other wildlife species.
- Seabirds:
  - Construction activities would not occur at night. If for unforeseen reasons night work is required, it would not occur during seabird fledging season (September 15 through December 15) and fully shielded lights would be used outside of that period.
  - Outside lights would be dark sky compliant and seabird friendly by being fully shielded and considered "acceptable" per the Department of Land and Natural

Resources (DLNR) guidance (https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf).

- Blackburn's sphinx moth: Construction activities would not occur at night. If for unforeseen reasons night work is required, moths attracted by any fully shielded lights will be left undisturbed. Left alone, most moths will rest and leave when a light is turned off. Supervisors will be advised to leave moths undisturbed and take photos if a subject is suspected to be a sphinx moth.

3.6 ARCHAEOLOGICAL AND CULTURAL RESOURCES

The lands encompassed by HOST Park were previously the subject of DLNR- State Historic Preservation Division's (SHPD) approved archaeological surveys conducted by Barrera (1985a) and Donham (1987) (Figure 3-7). Some sites within these survey areas have undergone archaeological data recovery investigation (Barrera 1989; Corbin 2000), while at others, archaeological site preservation planning has been implemented (Rechtman and Clark 2004, 2006). Those reports, and the more recent *Archaeological Inventory Survey Update for the Proposed NELHA Roads C, D, and E (TMKs: 3-7-3-43: portions 073, 080, 083, 089, and 091) ʻOʻoma 1st and 2nd and Kalaoa 5th ahupuaʻa, North Kona District, Island of Hawaiʻi* (Rechtman and Clark 2012) form the basis for the information and analysis contained in the following subsections. No new studies were conducted for the proposed project and the SHPD's Hawaiʻi Cultural Resources Information System (HICRIS) does not identify any sites within the current project site.

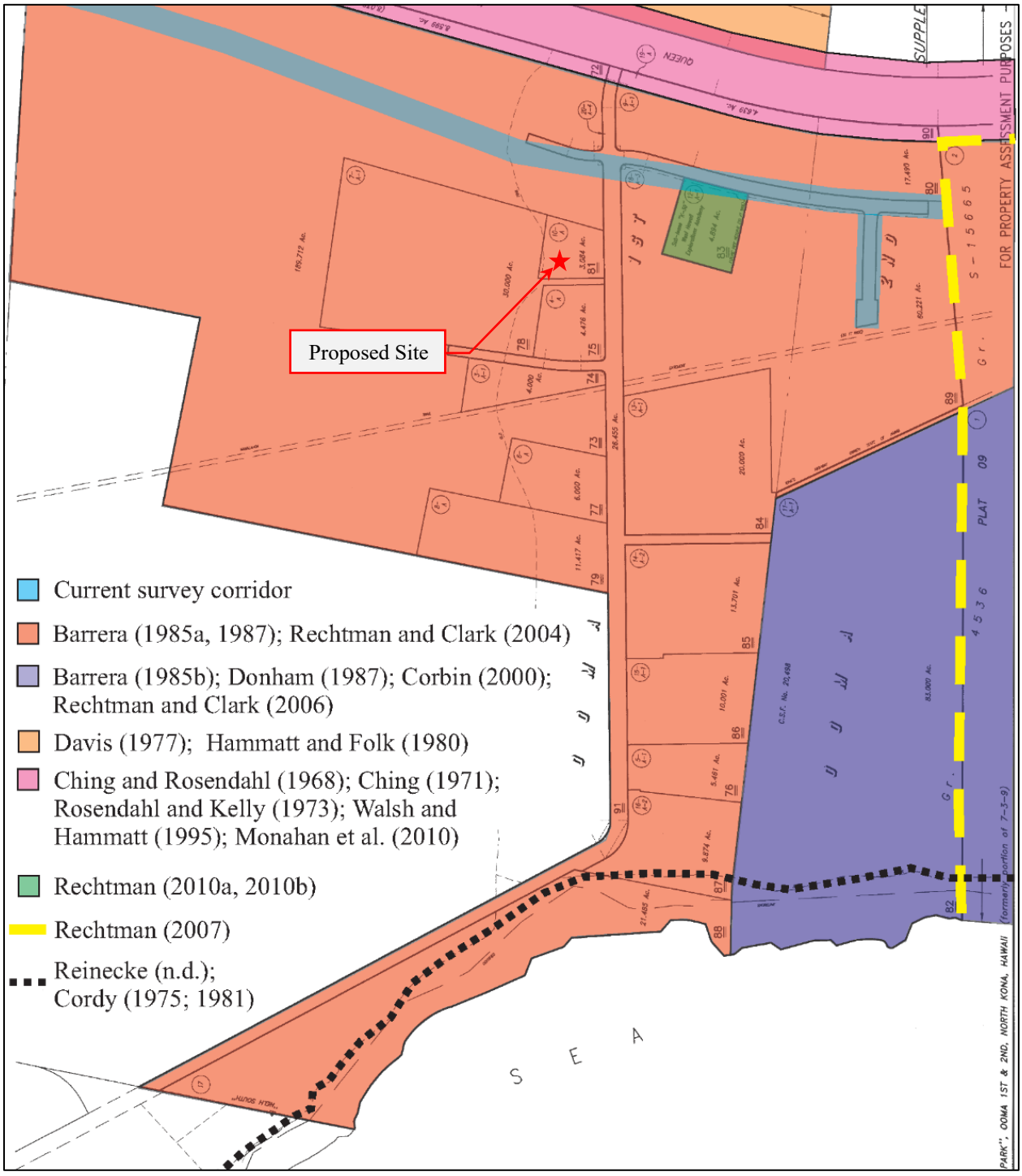
3.6.1 ARCHAEOLOGY

3.6.1.1 Prior Archaeological-Historical Research

In 1929-1930, Bishop Museum contracted John Reinecke to conduct a survey of Hawaiian sites in West Hawaiʻi, including coastal portions of the ʻOʻoma and the Kalaoa ahupuaʻa (Reinecke n.d.). A portion of Reinecke's survey fieldwork extended north from Kailua as far as Kalāhuipuaʻa. His work being the first attempt at a survey of sites of varying function, ranging from ceremonial to residency and resource collection. During his study, Reinecke traveled along the shore, documenting nearshore sites. Where he could, he spoke with the few native residents he encountered. Among his general descriptions of the region, Reinecke observed:

> *This coast formerly was the seat of a large population. Only a few years ago Keawaiki, now the permanent residence of one couple, was inhabited by about thirty-five Hawaiians. Kawaihae and Puako were the seat of several thousands, and smaller places numbered their inhabitants by the hundreds. Now there are perhaps fifty permanent inhabitants between Kailua and Kawaihae–certainly not over seventy-five.*
>
> *When the economy of Hawaii was based on fishing this was a fairly desirable coast; the fishing is good; there is a fairly abundant water supply of brackish water, some of it nearly fresh and very pleasant to the taste; and while there was no opportunity for agriculture on the beach, the more energetic Hawaiians could do some cultivation at a considerable distance mauka.*

Figure 3-7: Prior Archaeological Research at HOST Park



Source: Rechtman Consulting (2014)

The scarcity of remains is therefore disappointing. This I attribute to four reasons: (1) those simply over looked, especially those a short distance mauka, must have been numerous; (2) a number must have been destroyed, as everywhere, by man and by cattle grazing; (3) the coast is for the most part low and storm-swept, so that the most desirable building locations, on the coral beaches, have been

> *repeatedly swept over and covered with loose coral and lava fragments, which have obscured hundreds of platforms and no doubt destroyed hundreds more; (4) many of the dwellings must have been built directly on the sand, as are those of the family at Kaupulehu, and when the posts have been pulled up, leave no trace after a very few years.*
>
> *The remains on this strip of coast have some special characteristics differentiating them from the rest in Kona. First, there is an unusual number of petroglyphs and papamu, especially about Kailua and at Kapalaoa. Second, probably because of the strong winds, there are many walled sites, both of houses and especially of temporary shelters… (Reinecke n.d.:1-2)*

The following site descriptions are quoted from Reinecke's manuscript of fieldwork conducted between Pūhili Point on the Kohanaiki-'O'oma 2nd boundary, and into Kalaoa 5th. In the site descriptions below, Reinecke references the occurrence of at least six house sites; seven enclosures and pens (one of which is an "old cattle pen"); eleven terraces and platforms (one of which he felt was a "heiau"); two caves; two ahu; a stepping stone trail; three waterholes and a well; and eleven rock shelters. Apparently, no one was residing in the area at the time of his field survey.

Reinecke's site descriptions, south to north, across 'O'oma 2nd and 'O'oma 1st included:

> *Site 66. Very doubtful dwelling site. Then a row of sand-covered platforms at the border of the sand and the beach lava, enough for 6-10 homes. Remains of an old, large pen.*
>
> *Site 67. Dry well on the crest of the beach.*
>
> *Site 68. Water hole, two small platforms, four or more shelters, pens with very small platform.*
>
> *Site 69. Large cattle pen. Doubtful old, rough platform at its north end. Remains of two old platforms by an ahu to the north.*
>
> *Site 70. Walled platform, S.E. corner terraced, badly broken down. Platform mauka. The walls of this and of Site 73 are built of thin pieces of pahoehoe surface lava, rather unusual in appearance. [Reinecke n.d.:15]*
>
> *Site 71. A knob partly walled on its slopes, with house site. Adjoining it on the south is a rough platform with three smooth boulders – heiau and kuula? Back of this a house platform and a platform about a fine shelter cave. Another platform and wall are about a slight natural depression filled with bones, including those of a whale.*
>
> *Site 72. Ruins of a pen.*
>
> *Site 73. Apparently a modern dwelling site of unusual construction; two terraces of pebbles, the upper 29x25x2 in front and 4-5' high elsewhere; the lower 19x10x25x3, with a three sided pen at N.E.; surrounded by a carefully laid wall.*
>
> *Site 74. A shelter about a shallow cave; remains of another shelter; an ahu.*

> *Site 75. Trace of site; house platform; enclosure on shore. There are many faint traces of sites on this strip of coast. Toward the north is an unmistakable small site.*
>
> *Site 76. Modern shelter pen; house or shelter site; shelter mauka by kiawe tree.*
>
> *Site 77. Platform; tiny pen; sites of some kind marked by stones in lines on the pahoehoe flow.*
>
> *Site 78. Slightly brackish springs and pools; house site, shelters, stepping stone path leading to the walled house site… [Reinecke n.d.:16]*

Reinecke's description of the features, albeit limited, contains valuable information about site condition and provides a 70 plus year perspective on natural degradation along this coastline (c.f., Donham 1987:7). In 1971-72, DLNR started an inventory of known archaeological sites and visited the sites Reinecke recorded along the ʻOʻoma coastline. These sites were assigned State Inventory of Historic Places (SIHP) site numbers, site forms were completed, and sketch maps were made. Reinecke's sites were assigned SIHP Sites 1911–1919.

In 1975, Ross Cordy carried out an intensive survey and subsurface testing program along this portion of the coast. He assigned Bishop Museum site numbers to the sites recorded by Reinecke, and synthesized the data he generated with those from seven other North Kona ahupuaʻa as part of his doctoral dissertation (Cordy 1981). Cordy (1985) further documented his work in an overview summary report for the ʻOʻoma and Kalaoa areas.

Davis (1977) conducted an archaeological survey of a proposed agricultural park in ʻOʻoma 1st and Kalaoa 5th ahupuaʻa located mauka of Queen Kaʻahumanu Highway (Figure 3-7). Davis recorded a number of archaeological sites including surface complexes of habitation features, lava tubes used for habitation and refuge, a wall, several cairns, and two trails. Four of the lava tubes were the subject of an archaeological data recovery project reported on by Hammatt and Folk (1980). The wall (Site 6432), recorded along the boundary between ʻOʻoma 1st and 2nd ahupuaʻa, extends into the current study area following that boundary.

In 1985, Barrera began a series of studies, survey and data recovery, in Kalaoa 5th, ʻOʻoma 1st and 2ndahupuaʻa (1985a, 1985b, 1989, 1992), two of which (Barrera 1985a, 1989) are the subject of this update survey. Barrera's work began with a reconnaissance of a 450-acre portion of the NELHA host park that included the entire current project area (Barrera 1985a; see Figure 3-7). Barrera conducted pedestrian sweeps across the project area at intervals of 100-feet looking for evidence of past use. He identified 45 sites, including the Māmalahoa Trail (SIHP Site 2) and four other sites previously assigned the SIHP designations (Sites 1917, 1919, 5603, and 5604), and 40 sites not previously assigned SIHP designations (Sites 10151-10190). The sites identified by Barrera (1985a) were not recorded in detail, but were briefly described, plotted on a scaled map of the project area, and photographed. Barrera summarizes his findings as follows:

> *The sites located during this reconnaissance indicate a light, probably temporary utilization of the inland area and primary concentration of settlement at the coast. Such inland features as were found are small, scattered mounds and crude shelters with little or no midden deposits. The coastal sites, on the whole, can be characterized as large, well built structures of a more permanent nature, as*

> *evidenced by the presence of considerably greater amounts of midden materials and artifacts. (1985a:48)*

Specifically, the sites recorded by Barrera (1985a) include fourteen habitation shelters or shelter complexes (Sites 1917, 1919, 5603, 5604, 10154, 10166, 10168, 10170, 10171, 10175, 10177, 10179, 10180, and 10182), two midden scatters (Sites 10151 and 10185), twelve isolated stone mounds (Sites 10152, 10153, 10156, 10157, 10160, 10162, 10167, 10169, 10174, 10176, 10186, and 10189), four mound complexes (Sites 10161, 10181, 10187, and 10188), a habitation cave (Site 10155), three pāhoehoe excavations (Sites 10158, 10164, and 10184), six C-shaped enclosures (Sites 10159, 10163, 10165, 10172, 10173, and 10190), and two "petroglyphs" (Site 10178) interpreted as Historic boundary markers. A more recent archaeological field inspection of five acres (TMK:3-7-3-43:83) within the Barrera (1985a) project area reported no additional findings, nor the presence of archaeological resources of any kind (Rechtman 2010a, 2010b). A preservation plan has already been implemented for the portion of the Māmalahoa Trail (SIHP Site 2) that crosses the NELHA property (Rechtman and Clark 2004).

Barrera (1985b) then conducted an archaeological reconnaissance of a 350-acre parcel located in ʻOʻoma 2nd Ahupuaʻa between the coastal jeep road and the NELHA host park boundary (see Figure 3-7), recording 29 new sites and 12 sites previously documented by Cordy (1975, 1985). A later DLNR-SHPD field check of the area (Cordy 1986) concluded, however, that while the inland portion of the Barrera (1985b) project area had been adequately surveyed, the coastal portion had not. Cordy (1986:5) found the survey to be deficient because it did not include the coastal portion of the parcel between the Jeep road and the coast, and it failed to record numerous small coastal sites that were noted, but not reported on. Cordy (1986) actually identified six new sites during the field check. The Barrera (1985b) survey area would later be re-examined by Donham (1987).

Following the completion of the Barrera (1985a, 1985b) reconnaissance, but prior to the Donham (1987) survey, a mitigation plan entitled *Hawaii Ocean Science and Technology Park Work Program for Archaeological Data Recovery* was generated by DLNR-SHPD for the Barrera (1985a) project area. Three levels of further work were called for in the plan including additional recording only (Sites 10154, 10159, 10161, 10163, 10165, 10170, 10172, 10173, 10179, 10180, 10187, 10188, and 10190), further recording and excavation (Sites 10166, 10171, 10175, and 10182), and excavation only (Sites 1917, 1919, and 10185). The data recovery program was implemented by Barrera (1987). As a result of the additional study Barrera (1987) found that the earliest occupation of the project area was around the middle of the sixteenth century, with occupation continuing and increasing throughout the seventeenth and early eighteenth centuries, but that by the end of the eighteenth century most of the sites had been abandoned. The archaeological evidence overwhelmingly indicated that the exploitation of marine resources was the primary occupation of residents at the coastal structures in ʻOʻoma and Kalaoa.

Donham (1987) conducted archaeological survey and testing at a 314-acre coastal parcel in ʻOʻoma 2nd Ahupuaʻa located makai of the current project area (see Figure 6). That study, which re-inventoried the sites previously identified by Barrera (1985b), was a comprehensive inventory of sites for an Environmental Impact Statement prepared in 1991. Including the sites that had been previously documented by Cordy (1975, 1985, 1986) and Barrera (1985a), Donham (1987) recorded a total of 74 sites containing 279 features. The recorded sites included numerous formal feature types that were interpreted as having been used for temporary and permanent habitation, ceremonial, burial, transportation, quarry, and indeterminate purposes. These findings indicated

that the earlier Barrera (1985b) study had indeed been inadequate, especially in the coastal portions of the project area. Two of the sites reported on by Donham (1987) were later the subject of an archaeological data recovery report prepared by Corbin (2000). Sites 1916 and 18028, both habitation complexes located in the coastal portion of ʻOʻoma 2nd Ahupuaʻa, were extensively excavated in 1999. Radiocarbon dates indicated that both complexes were established around A.D. 1600 to 1650, and that the exploitation of marine resources, based on the artifact assemblage, was the primary activity of residents there.

More recently, a preservation plan (Rechtman and Clark 2006) was implemented for seven of the sites that fall within the NELHA portion of the Donham (1987) survey area (Sites 1913, 1914, 1915, 16132, 18025, 18026, and 18027). Also, an update inventory survey of the southern portions of the combined Donham (1987) and Barrera (1985a, 1985b) project areas (see Figure 3-7) was conducted (Rechtman 2007). This update inventory survey revealed the presence of two additional sites (Site 25932 and 26678) within the Donham (1987) survey area. Both sites were lava tubes containing human skeletal remains located approximately 200 meters makai of the Māmalahoa Trail (Site 2).

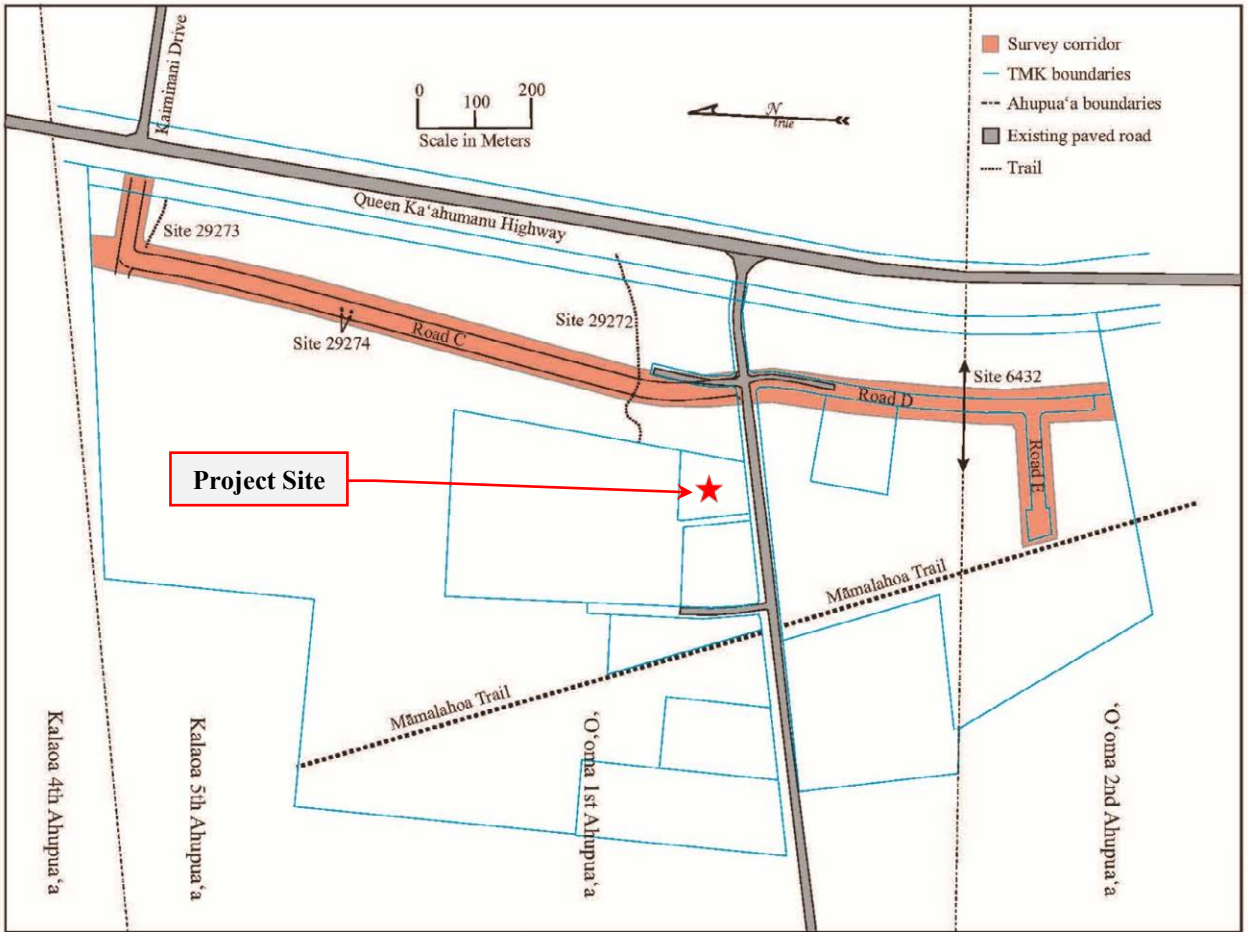
The Queen Kaʻahumanu Highway right-of-way has been the subject of several archaeological studies (see Figure 3-7). Prior to its construction, the right-of way was surveyed for archaeological sites by Ching and Rosendahl (1968). Additional reporting on sites within the highway alignment was provided by Ching (1971), and salvage work at selected sites was reported by Rosendahl and Kelly (1973). More recent archaeological survey for the proposed widening of the Queen Kaʻahumanu Highway by Cultural Surveys Hawaiʻi, Inc. (Walsh and Hammatt 1995; Monahan et al. 2012), however, has identified several archaeological sites within ʻOʻoma 1st and 2nd and Kalaoa 5th ahupuaʻa along the makai edge of the current highway alignment. While Walsh and Hammatt (1995) identified only Site 6432 (the core-filled wall along the boundary between ʻOʻoma 1st and 2nd ahupuaʻa), ongoing work reported on by Monahan et al. (2012) has identified at least six additional sites in this area. The additional sites include a grouping of cairns, 2 pāhoehoe excavations, a small lava tube, a possible filled crevice, and a modified lava blister.

3.6.1.2 Historic Properties Near the Project Site

The closest historic properties identified during prior archaeological research, to the proposed project, are the following (see Figure 3-8):

- *SIHP # -2, Māmalahoa Trail*. This trail is roughly 700 feet west of the project site. A preservation plan has been implemented for the portion of the Māmalahoa Trail that crosses the NELHA property (Rechtman and Clark 2004).
- *SIHP # -29272, Trail/Roadway*. Depicted in a 1928 U.S. Geological Survey (USGS) Keāhole Quadrangle, the mauka/makai trail appears to have been a primary transportation route during early Historic times (perhaps even used as a Jeep trail beginning in the 1940s) providing access to the ʻOʻoma-Kalaoa shoreline areas from points mauka. And, given the heavily worn central footpath it is also likely that this trail has Precontact origins. (Rechtman Consulting, 2012). The trail is a little over 300 feet north of the proposed site which terminates on the eastern boundary of TMK 7-3-043:078 occupied by Koyo USA Corporation.

Figure 3-8: Locations of Previously Identified Historic Properties Near Project Site



Source: Rechtman Consulting, LLC (2012)

- *SIHP # - 6432, Core-filled Rock Wall*. In 1977, Davis described a historic boundary core-filled rock wall that runs east to west. The wall ranges between 70 to 80 centimeters wide and 60 to 130 centimeters tall. The wall was most likely constructed to define property interests and contain the movement of cattle during the Maguire period of ownership of coastal ʻOʻoma 2 Ahupuaʻa, and was not likely constructed until after 1901. The wall is located over 1,200 feet south of the proposed site.
- *SIHP # -29273, Stepping-stone Trail*. The mauka/makai trail consists of a single row of pāhoehoe slabs set in ʻaʻā and disaggregated pāhoehoe substrate to facilitate ease of walking. No additional cultural material was observed at this site. Given the lack of historic (or modern) debris, it appears as though this trail segment has a Precontact Origin. This trail does not appear to have been a "major" transportation route, but rather may have been part of a localized trial network connecting sites in the shoreward and lower kula portions of the Kalaoa-ʻOʻoma area (Rechtman Consulting, 2012). The trail is located over 0.7 miles north-northeast of the proposed project site.
- *SIHP # -29274, Cairns*. Two similarly constructed rock cairns (Features A and B), were located on level pāhoehoe bedrock roughly 15 meters apart. Feature A consists of about 50 small to medium angular pāhoehoe cobbles 90 cm x 75 community in outline and rises 50 community above the ground surface. Feature B (southwest of

Feature A) is 135 community x 90 community in outline and 58 community tall with about 60 small to medium sized angular pāhoehoe cobbles. It is believed the cairns represent survey markers placed during the 1902 Hawai‘i Territory Survey fieldwork for the proposed Kalaoa-‘O‘oma Homesteads to mark a change in direction of a proposed but never constructed roadway. The cairns are located less than half a mile north-northeast of the project site.

3.6.1.3 Potential Impacts

There are no historic properties evident on the project site, nor have any been identified in the prior archaeological research reviewed in Section 3.6.1.1. There are some known historic properties in the region, but they are more than 300 feet away and there are other developments between the project site and these historic properties.

In the short-term, during construction of the proposed project, there will be little to no potential for adverse impacts to unidentified, subsurface historic properties. The site is already heavily modified and no significant excavation is required. The minor foundation excavations will likely only encounter material disturbed during the original development of the site. The very limited scope of physical disturbance required to implement the proposed action, its distance from historic resources, and the presence of intervening development collectively ensure that the proposed project would not adversely affect historic properties.

Once the project has been constructed, operation of the R&D unit would not involve any ground-disturbing activities or incremental development and, therefore, would not have the potential to impact known or unknown historic properties.

The No Action Alternative would not include new construction; maintenance of the existing facilities already present on the site would continue. It would not involve any activities that would have the potential to adverse effect archaeological resources.

3.6.1.4 Avoidance, Minimization, or Mitigation Measures

Based on SDEI’s review of available archaeological evidence, the following measures would be implemented to avoid and minimize potential impacts to historic and cultural resources:

- Consultation with SHPD to the degree necessary during the planning and permitting process.
- Brief project construction workers on the history of the area and inform them of the possibility of inadvertently encountering unknown historic/cultural resources, including human remains.
- Cease all activities if historic/cultural resources are inadvertently encountered during construction activities and notify SHPD pursuant to HAR § 13-280-3. If iwi kūpuna (i.e., ancestral remains) are identified, all earth moving activities in the area would stop, the area would be cordoned off, and SHPD, the medical examiner, and the Hawai‘i Police Department would be notified pursuant to HAR § 13-300-40.

3.6.2 CULTURAL IMPACT ASSESSMENT

3.6.2.1 Ethnographic Data

In addition to the archaeological, historical, and documentary research discussed in prior sections, SDEI invited several individuals with lineal and cultural ties to the area and its vicinity to provide input on valued cultural, historical, or natural resources in the project area, the extent to which those resources could be affected by the proposed action, and feasible action(s) SDEI could take to protect native Hawaiian rights. This effort included sending letters to several Native Hawaiian Organizations (NHOs) during the scoping process (Section 6.2.1) in January 2024, and discussions with community members that advise NELHA in August 2024.

Discussions with NHOs and other members of the community is likely to continue after the publication of this DEA. The sections below summarize the information currently available to SDEI and their assessment of potential project impacts based on that information. SDEI will continue (*i*) consult with the community, (*ii*) consider their project's impacts, and (*iii*) consider measures to reduce adverse effects.

3.6.2.2 Traditional and Customary Cultural Practices and Resources in the Project Area

There are a variety of traditional and customary practices which are associated with ʻOʻoma, Kalaoa, and the broader Kekaha region. They include: (*i*) moʻōlelo (traditional stories); (*ii*) habitation; (*iii*) travel and trail usage; (*iv*) loko iʻa (fishponds); (*v*) loko paʻakai (salt making beds); and (*vi*) lawaiʻa (fishing).

There are moʻōlelo—native traditions and historical accounts—of the Kekaha region that span several centuries. There are very few accounts that have been found to date, that specifically mention ʻOʻoma and Kalaoa, the placenames most closely tied to HOST Park. Thus, narratives that describe neighboring lands within the Kekaha region help provide an understanding of the history of these ahupuaʻa, describing features and the use of resources that were encountered on the land.

The reason there are so few accounts for ʻOʻoma, and Kalaoa is that they may have been considered marginal settlement areas, occupied only after the better situated lands of Kekaha—those lands with the sheltered bays, and where fresh water could be easily obtained—were populated. As the island population grew, so too did the need to expand to more remote or marginal lands. This thought is found in some of the native traditions and early historic accounts below. However, as people populated the Kekaha lands, they came to value its fisheries—those of the deep sea, near shore, and inland fishponds. Specific moʻōlelo tied to the project vicinity and its broader Kekaha region include[2]:

- Punia (A Tale of Sharks and Ghosts of Kekaha).
- Ka-Lani- Kauikeaouli (The Birth of Kamehameha III).
- Kaʻao Hoʻoniua Puʻuwai no Ka-Miki (The Heart stirring Story of Ka-Miki).
- Ka Pūnāwai o Wāwāloli (The Pond of Wāwāloli).

[2] The names of moʻōlelo are paraphrased from Fornander's *Hawaiian Antiquities and Folklore* (Fornander 1959).

- Ka Loko o Pā'aiea (The fishpond of Pā'aiea).
- Na Ho'omana'o o ka Manawa (The Recollections of a Native Son).
- Ko Keoni Ka'elemakule Mo'ōlelo Pono'i (The True Story of John Ka'elemakule).

Other valued natural, cultural and historical resources are still present and used in various parts of Kekaha, including Kalaoa. On the widest level, the entire range of wao (inland regions) that make up the ahupua'a, from the kahakai (shoreline) to the wao akua (cloud forests), have a level of cultural importance. More specifically, ko'a fishing shrines and the natural landmarks such as pu'u (hills) that guide fishermen to them are examples. Springs, ponds, and other coastal water features may have not only biological but also cultural significance. Burial sites for 'iwi kūpuna, including caves, are important resources to protect, as are some other archaeological resources.

No such resources exist on the proposed project site. No caves, springs, pu'u, gathering resources or other natural features are present on or near the project site that would support any traditional resource uses. HOST Park has been extensively surveyed for archaeological properties and there are none on or within 300 feet of the project site, nor are any known burials on or near the project site. Two individuals of the rare plant maiapilo (*Capparis sandwichiana*), used in traditional Hawaiian medicine, were previously found to be present near, but not on, the project site. Continued traditional use of maiapilo can occur through plants present at HOST Park.

In summary, SDEI's assessment is that there are no traditional and customary practices occurring within the project site, which is entirely within the fenced TMK 7-3-043:081. It is also SDEI's assessment that the broader HOST Park and the Kekaha region host a variety of traditional and customary practices including gathering, trail use, fishing, and mo'ōlelo. Native Hawaiian human burials are considered important cultural resources but were not identified as a concern associated with the proposed project because the project site is already fully developed.

3.6.2.3 Impacts to Traditional and Customary Native Hawaiian Rights

Adverse impacts may include alteration, destruction, modification, or harm of resources, including biological resources, sacred places, burial sites. It can also include loss of species and loss of access to areas upon which traditional and customary practices depend.

Construction and operation of the proposed project is not expected to impact traditional or customary practices in the area. It will be similar to previous uses of the site in that access to the site will be limited and activities will occur at the site during normal work hours. The cultural practices identified in Section 3.6.2.2 would continue without adverse impact during and after implementation of the Proposed Action.

3.6.2.4 Feasible Action to Reasonably Protect Native Hawaiian Rights

Based on the information available, the potential for effect or impairment of traditional or customary practices is negligible. Nonetheless, the BMPs identified in Section 3.6.1.4 should be implemented to ensure that no unanticipated effects to cultural resources occur.

3.7 NATURAL HAZARDS AND SEA LEVEL RISE

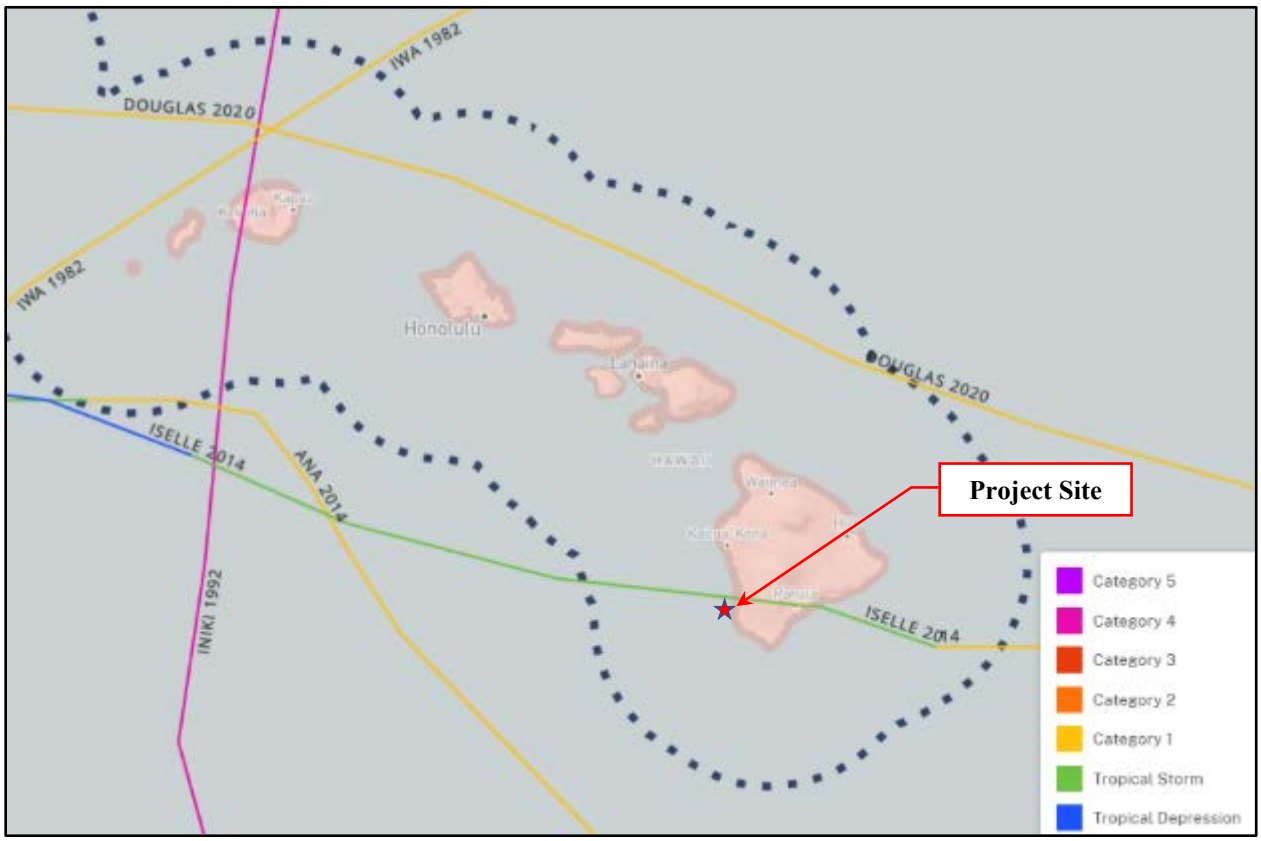
3.7.1 HURRICANES AND TROPICAL STORMS

Tropical cyclones originate over tropical or subtropical waters with organized deep convection and closed surface wind circulation around a well-defined center. Tropical cyclones extract heat energy from the ocean at high temperatures and heat export at low temperatures of the upper troposphere. Both hurricanes and tropical storms are tropical cyclones, with hurricanes having sustained wind speed of 74 miles per hour (mph) or more and tropical storms having wind speeds that range from 39 to 73 mph (National Oceanic Atmospheric Administration [NOAA]).

Generally, the National Weather Service's Central Pacific Hurricane Warning Center can expect four to five tropical cyclones in a normal season, with August and September being historically active months for storms in the region. Hurricanes are rare, as the combination of dry air, cooler water, large volcanic mountains, and wind shear results in downgrading to tropical storm as cyclones approach Hawai'i.

The first officially recognized hurricane to materialize in Hawaiian waters was Hurricane Hiki in 1950 and since there have been five hurricanes that have caused significant damage: Nina 1957, Dot 1959, 'Iwa 1982, Estelle 1986, and 'Iniki 1992 (School of Ocean and Earth Science and Technology [SOEST], University of Hawai'i). Figure 3-9 shows the hurricanes have passed within 60 miles of the main Hawaiian Islands in the past 40 years.

Figure 3-9: Hurricanes Within 60 Miles of the Main Hawaiian Islands (1982-2022)

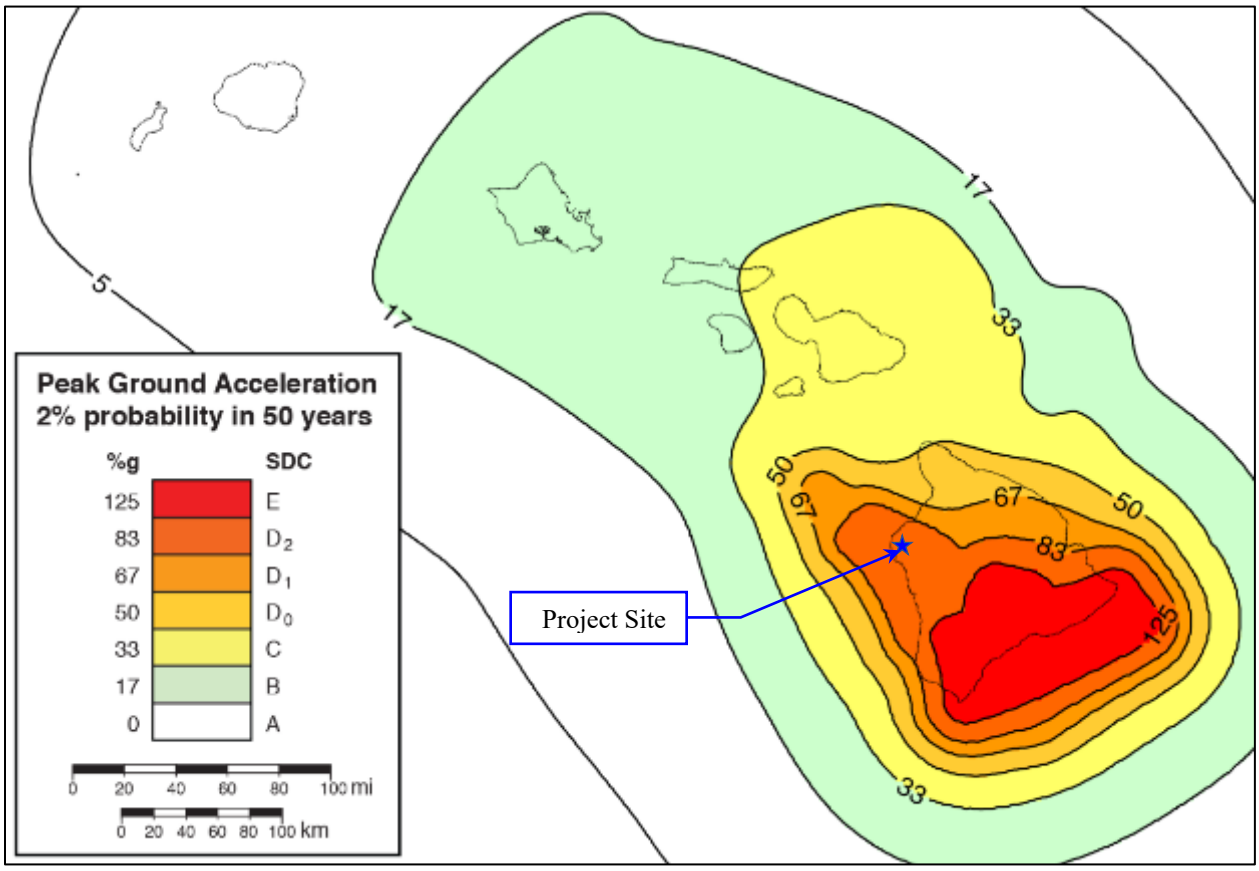


Source: https://coast.noaa.gov/hurricanes/#map=4/32/-80.

3.7.2 EARTHQUAKES

The USGS developed seismic hazard maps to represent the results of risk analysis and help estimate likely locations of future damaging earthquakes and the hazard they might pose in terms of ground shaking. The island of Hawai'i experiences high seismic activity caused by eruptive process within active volcanoes or by deep structural adjustments due to the weight of the islands on Earth's underlying crust (USGS 2019a). Based on the USGS Seismic Hazard Map (Figure 3-10), the island of Hawai'i has the highest expected ground acceleration (195 percent of gravity) that has a 2 percent chance of occurrence during a 50-year time period (Klein et al., 2001). This corresponds to Seismic Design Category (SDC) E, and described as near major active faults capable of producing the most intense shaking and causing considerable damage to structures enough to completely destroy buildings.

Figure 3-10: USGS Seismic Hazard Map Based on Past Earthquakes



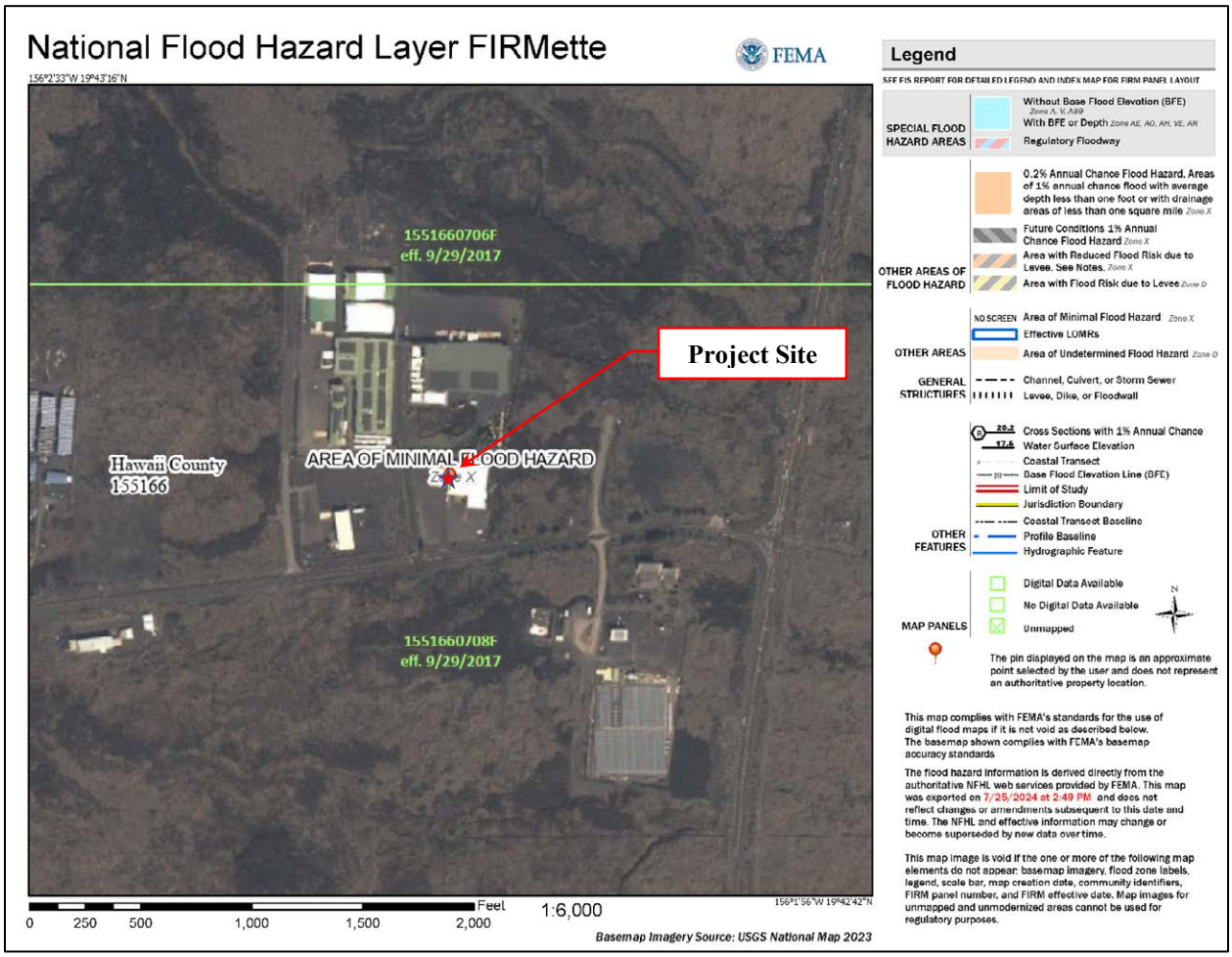
Source: https://www.usgs.gov/media/images/seismic-hazard-state-hawaii-based-past-earthquakes (Klein et al. 2001)

Like entire County of Hawai'i, the project site is designated by the Uniform Building Code as Seismic Zone 4. Current building codes, including the International Building Code, include minimum design criteria for structures to address the potential for damage due to seismic disturbances specific to each seismic zone. There is very little threat of volcanic eruptions directly affecting the project area.

3.7.3 FLOODING

Figure 3-11 illustrates the flood zones in North Kona based on Federal Emergency Management Agency's (FEMA) flood assessment tool. The entire project site is in Flood Zone X. This designation corresponds to areas that are subject to flooding from a potential 500-year flood or from a 100-year flood with flood levels of less than one foot. Areas designated as Zone X are outside of the 0.2 percent annual chance floodplain; because these areas are considered to have very low potential for flooding, no base flood elevations have been determined. The project is not in a floodway or special flood hazard area.

Figure 3-11: FEMA Flood Hazard Map

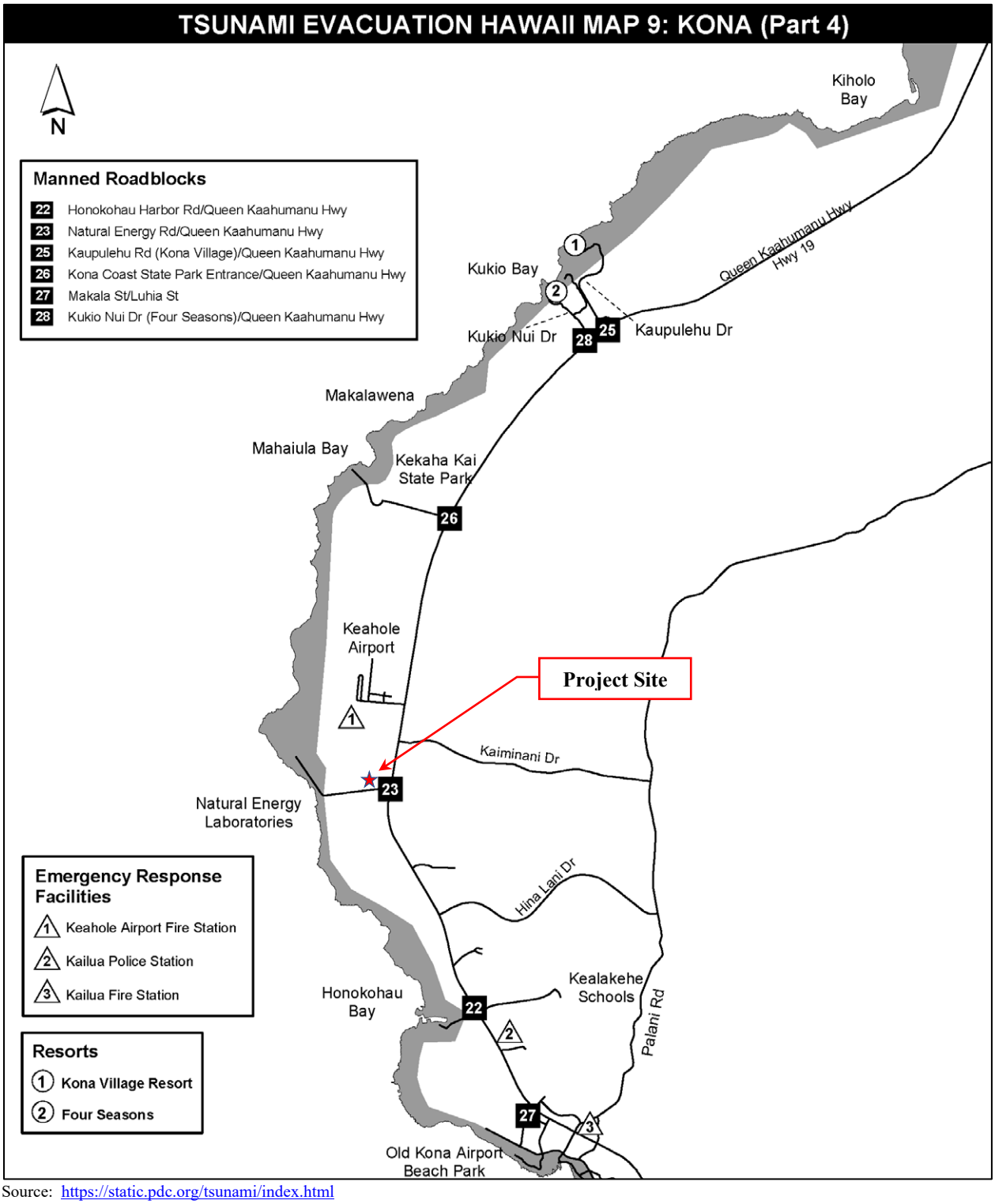


Source: FEMA Special Flood Hazard Areas for the State of Hawai'i.

3.7.4 TSUNAMI INUNDATION

As illustrated in Figure 3-12, the proposed project is outside the Tsunami Evacuation Zone and is not anticipated to be impacted in the event of a tsunami along the Kalaoa coastline.

Figure 3-12: Tsunami Evacuation Zones, Kailua Bay to Kīholo Bay



Source: https://static.pdc.org/tsunami/index.html

3.7.5 SEA LEVEL RISE

The *Hawai'i Sea Level Rise Vulnerability and Adaptation Report* (HSLR), prepared by the Hawai'i Climate Change Mitigation and Adaptation Commission (HCCMAC) (HCCMAC, 2017) combines best available science from the Intergovernmental Panel on Climate Change (IPCC), NOAA, and NASA to project sea level rise and vulnerability scenarios. These scenarios can be used to guide adaptation planning decisions and good practice recommendations.

The IPCC's "business as usual" scenario predicts up to 3.2 feet of global sea level rise (SLR) by 2100. Other recent observations and projections estimate that 3.2 feet of SLR could be reached as early as 2060. Both the HSLR Report and the 2018 *State of Hawai'i Hazard Mitigation Plan* recommend using the 3.2 feet SLR as an appropriate planning target when designing future projects.

The HCCMAC modeled the three chronic flood hazards associated with 3.2 feet of SLR: (*i*) passive flooding; (*ii*) annual high wave flooding; and (*iii*) coastal erosion. The combined footprint of these three hazards defines what the report terms the "Sea Level Rise Exposure Area" (SLR-XA) and indicates flooding in the area will be associated with "long-term, chronic hazards punctuated by annual or more frequent flooding events."

Figure 3-13shows the SLR-XA in the vicinity of the project site with 3.2 feet of sea level rise. The SLR-XA is based entirely on passive flooding; shoreline erosion is not anticipated given the rocky nature of the shoreline. To consider SLR passive flooding further, Figure 3-14 illustrates passive flooding under a 6-foot SLR scenario according to NOAA.

Figure 3-13: Sea Level Rise Exposure Area in Project Area under a 3.2-foot Sea Level Rise Scenario

Source: http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

As these figures show, low lying coastal areas, all far makai of the project site, will be prone to flooding due to SLR in the future.

Figure 3-14: Passive Flooding under a 6-foot Sea Level Rise Scenario

Source: http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

3.7.6 POTENTIAL IMPACTS

Neither the Proposed Action nor the No Action Alternative would have any discernable impact on the susceptibility of the area to natural hazards such as storms, earthquakes, flooding, tsunami, or SLR. Hazards may episodically impact all or portions of North Kona and any development within it, including the proposed project. Floods, tsunamis, and SLR are not anticipated to have any direct impacts on the proposed project.

3.7.7 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Critical avoidance measures involve locating the proposed project outside of flood zones (Figure 3-11), tsunami evacuation zones (Figure 3-12), and SLR hazard zones (Figure 3-13). In addition, all infrastructure constructed for the project will comply with regulatory controls to meet current seismic, plumbing, building, and critical infrastructure code design requirements, reducing the risk of failure in the event of hazards.

3.8 VISUAL AND AESTHETIC RESOURCES

3.8.1 EXISTING CONDITIONS

The goals of the *Hawai'i County General Plan* (HCGP) (HCGP, 2005), regarding natural beauty and protection of scenic resources (HCGP, Chapter 7. Natural Beauty, Section 7.2(a)-(c)) is to:

(a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.

(b) Protect scenic vistas and view planes from becoming obstructed.

(c) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

That chapter goes on to set standards which are intended to provide guidelines for designating sites and vistas of extraordinary natural beauty that merit protection. The HCGP, Section 7.4(b)-(c) identifies the following as being eligible for protection:

(b) Coastline areas of striking contrast , e.g. Laupahoehoe Point.

(c) Vistas of distinctive features.

Table 7-11 of the *Kona Community Development Plan* (KCDP) goes on to identify protected sites in North Kona; they are reproduced below in Table 3-3. None of the sites identified are on or near the project site but the project site is within the makai viewplane from Queen Kaʻahumanu Highway.

Table 3-3: HCGP Natural Beauty Sites, District of Kona (see HCGP, Table 7-11)

Site	***TMK No.***	***Ahupuaʻa or Region***
Puʻu Waʻawaʻa	7-1-001:004	Puʻu Waʻawaʻa
Kīholo Bay/Beach Area	7-1-002:008	Puʻu Waʻawaʻa
Keawaiki Bay	7-1-002:008; 7-1-003:002	Puʻu Waʻawaʻa, Puʻu Anahulu
Hualālai	n/a	Kaʻūpūlehu
Kaʻūpūlehu	7-2-003:001, 002	Kaʻūpūlehu
Kua Bay Area	n/a	Maniniʻowali
ʻŌpaeʻula Pond	7-2-004:001	Makalawena
Makalawena	7-2-004:001	Makalawena
Kahoiawa	7-2-04:003, 004	Awakeʻe
Kakapa Bay Area	7-2-004:004	Kūkiʻo II
Kūkiʻo Bay/Beach Area	7-2-004:005	Kūkiʻo I
Mahaiʻula Bay/Beach Area	7-2-005:003	Mahaiʻula
Kaloko Pond	7-3-009:002	Kaloko
Honokōhau Fish Pond	n/a	Kealakehe
Honokōhau coastline	7-4-008:004, 003	Honokōhau-Kealakehe
ʻAimakapā	7-4-008:010	Honokōhau
White Sand Beach	7-4-008:010	Honokōhau
White Sand Beach	7-5-005:007	Keahuolū
Viewplane from Kuakini Highway (Mauka and Makai)	n/a	Hōlualoa-Keauhou
Viewplane from Kamehameha III Road (Mauka and Makai)	n/a	Kahaluu-Keauhou
Keauhou	n/a	Keauhou I and II
Kahaluu Bay Area	n/a	Kahaluʻu II
Viewplane along Queen Kaʻahumanu Highway (Mauka and Makai)	n/a	n/a

Source: Hawaiʻi County General Plan (2005), Table 7-11 Natural Beauty Sites, District of North Kona.

Chapter 4 of the amended (2019) KCDP presents the goals, objectives, policies, and actions for the KCDP. The first of eight guiding principles for the KCDP calls to, "Protect Kona's natural resources and culture." Section 4.3 of the KCDP directly addresses environmental resources including opportunities and constraints related to visual and aesthetic resources. The KCDP's overall strategy for managing impacts to these resources consists of: *(*i) recognizing the multi-value importance of mauka lands; (*ii*) turning stormwater management into an asset; (*iii*) not exceeding the limits of the groundwater resources; (*iv*) integrating coastal resources; and (*v*) protecting sensitive resources. This final element of the KCDP's strategy for managing impacts to natural resources most directly pertains to visual and aesthetic resources protection, establishing the following goal (Section 4.3.3 *Environmental Resource Goal*):

> *The natural and cultural resources enhance Kona's character together with the built environment, developed in harmony with ecological principles, where residents and visitors enjoy and interact with nature through a networked system that promotes a healthy active lifestyle, and where the financial and moral commitment reflects the high level of caring that the Kona people have for the land.*

The KCDP goes on to lay out a serios of objectives, policies, and actions in service of this goal. Specifically, per Policy ENV 1.2 (see KCDP, Section 4.3.3), it envisions a cohesive watershed management plan for open space intended to protect values such as aesthetics and scenic vistas. While the KCDP does not provide a list of protected views or panoramas, it does call for (see KCDP, Section 4.3.2, 1(e)) protecting sensitive resources, including scenic resources, by creating a system to classify sensitive resources and to develop an inventory of them. Thus, while views in the immediate vicinity of the project area are not specifically identified as meriting protection by the KCDP, it is understood that valuable vistas in the area (e.g., views towards the coastline from Queen Kaʻahumanu Highway) are part of the area's valued natural heritage and merit sensitivity in planning and development. In addition, all development proposed by the Sea Dragon Energy Project are within the previously developed HOST Park, and within the County-designated "Kona Urban Area" (see KCDP, *Figure 4-7 Official Kona Land Use Map*).

3.8.2 POTENTIAL IMPACTS

The potential for the proposed Sea Dragon Energy Project to impact visual and aesthetic resources is minimal. The project site is already developed and situated near the airport and within an existing science and technology park intended for uses such as the Proposed Action. No development is proposed that will be taller than the existing building on the project site. The land on which the project will be built is designated as being in the State Urban District and is identified as being in the Kona Urban Area by the KCDP. No specific sites considered significant for their scenic character in the *Hawai'i County General Plan* are present nearby. The closest such sites are approximately 1.8 miles south at Kaloko Pond and roughly five miles north at Makalawena Beach. While the area is designated for ocean-related industrial operations, a land use where scenic considerations are not paramount, the nearby shoreline areas are scenic and used for public recreation (Geometrician Associates, LLC, 2011). The project site is located over half a mile from the shoreline in a non-scenic area. The view from the nearest shoreline, from Queen Kaʻahumanu Highway toward the shoreline, and from Kaloko Pond will not be altered by the proposed project. Consequently, no significant adverse impacts to views and scenic vistas are anticipated.

Under the No Action Alternative, SDEI would not implement the proposed project at the project site and the site would likely be leased to another business in the future. No construction or operational activities would occur immediately and no impacts to visual or aesthetic resources identified in state or county plans would occur.

3.9 ROADWAYS AND TRAFFIC

3.9.1 EXISTING CONDITIONS

The Island of Hawai‘i is served by a network of more than 1,393 miles of public roads. This includes more than 390 miles of state highways. The backbone of the system is the Hawai‘i Belt Road which circles the island. The Belt Road is comprised of State Route 11 in the south and State Route 19 in the north. Queen Ka‘ahumanu Highway (State Route 19) provides access to NELHA and is part of the Hawai‘i Belt Road.

Queen Ka‘ahumanu Highway is located along the east or mauka side of HOST Park. South of Kealakehe Parkway, the highway has been widened to four lanes and has a posted speed limit of 45 miles per hour. From Queen Ka‘ahumanu Highway, the following roads provide access to the project site:

- Makako Bay Drive, three-legged, right-turn-only, unsignalized intersection. Makako Bay Drive, formerly referred to as the NELHA Access Road or the OTEC Road, is a 24-foot wide asphalt concrete pavement road. The road provides access to HOST Park and tenant facilities, the shoreline, “Pine Trees” beach, and Wāwāloli Beach Park. It is a two-lane, undivided, public roadway. The right-of-way varies between 80 feet and 110 feet. There is an access gate near Makako Bay Drive’s intersection with Queen Ka‘ahumanu Highway; this gate is closed between 8:00 p.m. and 6:00 a.m. The posted speed limit is 25 mph, it has a dedicated left-turn lane at its intersection with Kahili Street, and is lit.
- Kahilihili Street, 4-legged, signalized intersection. Kahilihili Street was formerly referred to as NELHA Road C, is a paved two-lane road, and quickly bends to parallel Queen Ka‘ahumanu Highway and intersect Makako Bay Drive. It has a dedicated right-turn lane at its intersection with Makako Bay Drive and is lit. Kahilihili provides left turn access to and from HOST Park.

The Hawai‘i County Mass Transit Agency provides public transportation around the island on the Hele-On bus system. Service is provided to the major urban centers on the island via the main roadways. There is also shuttle service available in the Hilo and the Kona Districts. The Hele-On service uses a fleet of buses with a capacity of 33 to 45 passengers. The bus service stops twice Monday through Saturday (once northbound and once southbound) at the Kona International Airport at Keāhole terminal and two additional routes pass by the project area on Queen Ka‘ahumanu Highway twice in the northbound direction and three times in the southbound direction Monday through Saturday. On Sundays, one route passes the project area (once northbound and once southbound).

With regard to traffic, Queen Ka‘ahumanu Highway experiences substantial traffic volumes, with approximately 1,000 vehicles traveling in either direction during AM (~8:00-9:00 a.m.) and PM

(~2:00-3:00 p.m.) peak-hour traffic in the vicinity of its intersection with Makako Bay Drive. Makako Bay Drive experiences only modest traffic volumes, with approximately 150 vehicles traveling in either direction during AM (~8:00-9:00 a.m.) and PM (~2:00-3:00 p.m.) peak-hour traffic in the vicinity of its intersection with Kahilihili Street. Traffic volumes along Kahilihli Street are negligible, regardless of the hour.

3.9.2 POTENTIAL IMPACTS

Specific project activities with the potential to generate vehicle trips on Queen Kaʻahumanu Highway and contributing roadways include the following: (*i*) construction workers' commutes to and from the project site; (*ii*) delivery of construction material and equipment to the site; (*iii*) removal of construction waste and debris; and (*iv*) workers commuting to and from the project site during the operational period.

In total, the volume of construction-related vehicle trips on Queen Kaʻahumanu Highway would be small, spread throughout the day, and would not be concentrated during the morning and afternoon peak-hour traffic. Adequate space exists so that vehicle parking associated with construction activities will not interfere with the active traffic lanes along any public roadway. The operation of the proposed project would require only five (5) workers and would not substantially contribute to the volume of traffic on area roadways. This volume is likely to be far less than was the case when the site was being used by the former tenant.

Under the No Action Alternative, SDEI would not develop the proposed project at the subject site, consequently, no new trips would occur on area roadway.

3.9.3 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Construction activity related traffic impacts would be avoided and minimized by delivering large equipment and materials during off-peak times. To the extent practicable, the larger and more complex pieces of equipment will be consolidated into "skids" as discussed in Section 2.1.4, potentially reducing the total number of deliveries needed and the number of workers required for installation. The proposed project would require all construction workers to park vehicles and other equipment in appropriate areas at the project site.

3.10 OTHER RESOURCES AND TOPICS

The Proposed Action consists of constructing and operating an R&D unit for R&D purposes within a previously developed site at NELHA's HOST Park. As such, there are certain categories of resources that the Proposed Action does not have the potential to substantially impact. Therefore, the following topics, which are sometimes discussed in detail in EAs, are only briefly mentioned in this section:

- *Noise*. The predominant noise sources in the vicinity are wind, vehicular traffic from Queen Kaʻahumanu Highway and other roadways, and passing aircraft traveling to or from Kona International Airport at Keāhole. Aside from some brief increase due to construction activities, the Proposed Action does not involve activities or uses that have the potential to meaningfully affect the sonic environment beyond limits of the project parcel.

- *Public Utilities, Infrastructure, and Services*.
  - *Electricity and communications.* Hawaiian Electric C., Inc. provides electrical services to the project site via an existing distribution substation that was sized to serve HOST Park and its intended use as an ocean science and technology center. The project's demand for power at peak use is substantial (i.e., approximately 0.5 MW). SDEI has held discussions with Hawaiian Electric regarding the potential demand and have received assurances that the area infrastructure and supply are adequate to meet that demand. Hawaiian Telephone Company has an existing 3-inch conduit serving the NELHA facilities.
  - *Wastewater*. The existing lots are serviced through on-site individual wastewater systems. Exact wastewater generation totals are not known, as they are maintained and managed by the individual lot owners. Once constructed, the project will only produce modest quantities of sanitary wastewater from the 5-10 workers present on the site. The proposed R&D unit will not produce any wastewater; process water disposal is discussed in Section 3.4.2.
  - *Storm Water Management.* HOST Park is generally sloped, from approximately 143 feet +msl at its mauka boundary with Queen Kaʻahumanu Highway down to the shoreline. The terrain is very irregular and undulated due to the old lava flows present on the site. Using the County of Hawaiʻi Design Curve for Peak Discharge for hydrologic calculations, the total existing peak runoff from the drainage area above the Highway contributing to the old HOST Park section of the site is 3,800 cubic feet per second (cfs), for the peak, 24-hour storm. The on-site areas are broken down into six major drainage areas – 4 within the mauka section, where the project site is located, and 2 within the makai section. The total existing peak runoff from the mauka section of the site is estimated at 1,176 cfs. Some overland sheet flow may result during extremely rare events but overall, the porous, lava terrain of HOST Park generally allows surface flows to percolate into the groundwater. The Sea Dragon Energy Project will be required to retain stormwater on-site via drywells and/or retention basins. Once complete and placed into operation, the Proposed Action will not alter storm water quantity, quality, or drainage patterns in any significant way.
  - *Solid Waste.* The Proposed Action would generate small quantities of solid waste during construction. Once complete, the proposed R&D unit and other infrastructure will not produce appreciable quantities of solid waste. The volume and type of waste generated would not be unusual and would be disposed of at on-island facilities in accordance with applicable rules.
  - *Fire.* HOST Park is primarily served by the Hawaiʻi County Fire Department's (HCFD) Makalei Fire Station, Engine No. 21 at 72-4077 Hawaiʻi Belt Road. Emergency Medical Services (EMS) is provided by HCFD and EMS corresponds to calls with HCFD; the nearest hospital is Kona Community Hospital, approximately 17 miles away. The proposed action will not affect the operation or availability of the HCFD or EMS.

- *Police.* The project site is served by the Kona District Police Station, located at 74-611 Hale Māka‘i Place, in Kailua-Kona; this station serves portions of the Ka‘ū and South Kohala Districts. The Proposed Action would not affect the operation of the police department.
- *Schools.* The project area is served by: (*i*) Kealakehe Elementary School; (*ii*) Kealakehe Intermediate School; and (*iii*) Kealakehe High School. West Hawai‘i Explorations Academy Public Charter School is across Makako Bay Drive from the project site, and both Kahakai elementary School and Hōlualoa Elementary School are also nearby. The Proposed Action will not affect the operations or attendance of area schools.
- *Parks.* The nearest public parks are Wāwāloli Beach Park and Kohanaiki Beach Park. A little further to the south is the nearest national park, Kaloko-Honokōhau National Historical Park operated by the National Park Service. The Proposed Action would not affect access to or operations at the parks.

3.11 CUMULATIVE IMPACTS

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of a specific (proposed) project. Cumulative impacts may result from a series of projects that individually do not generate significant adverse effects, but collectively add up to a significant negative impact on the environment.

The primary relevant past, present, and reasonably foreseeable actions in this situation include (*i*) the establishment of NELHA, (*ii*) the prior development and use of the project parcel for the purposes of bottling desalinated sea water among other operations, (*iii*) the development of the road network in the region, and (*iv*) the implementation of the proposed project described in Section 2.1 of this report. The impacts of certain past actions are documented in HRS Chapter 343 documents prepared prior to their implementation. There are currently no foreseeable actions, as defined by HRS Chapter 343, related to the Proposed Action. The proposed project is not anticipated to cause any significant impacts; is not contingent on any other action, public or private; and would not individually cause future actions to be taken by any public or private entities. Therefore, the project would not generate new or greater cumulative impacts than have already taken place.

The anticipated benefit of the Proposed Action is to advance technologies that will increase resiliency, support sustained renewable generation growth, and help address the challenges of climate change through a range of potential applications.

3.12 SECONDARY IMPACTS

Secondary effects are associated with an activity but do not result directly from the activity. The Proposed Action does not appear to have the potential to involve significant secondary impacts to property valuation, population, housing, community services, public facility needs, employment, and compatibility with surrounding land uses. This is because the Proposed Action would not result in substantial changes in the cost or availability of water or other resources that land use changes and development depend on. For example, the Proposed Action:

- Would not foster regional population growth.
- Would not curtail or otherwise disrupt ongoing operations elsewhere at HOST Park, which has ample space for new development.
- Would not substantially impact employment opportunities in the Kailua-Kona region.
- Would not require the amendment of any state land use boundary or county zoning designation.
- Would not result in the subdivision of any land for the purposes of residential, agricultural, or commercial development.
- Would not provide access to currently inaccessible areas.
- Does not require other actions to be taken or services to be provided in the project area by government agencies or private parties.

Therefore, the Proposed Action would not induce land use changes or demographic changes in the region and would not cause significant secondary impacts.

4 CONSISTENCY WITH LAND USE PLANS, POLICIES, AND CONTROLS

This chapter discusses the relationship of the Proposed Action with applicable land use plans, policies, and regulations.

4.1 STATE OF HAWAI'I

4.1.1 HAWAI'I STATE PLAN, HRS § 226

Adopted in 1978 and last revised in 1991, the *Hawai'i State Plan* is intended to guide the future long-range development of the State by:

- Identifying goals, objectives, policies, and priorities for the State;
- Providing a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources;
- Improving coordination of federal, state, and county plans, policies, programs, projects, and regulatory activities; and
- Establishing a system for plan formulation and program coordination to provide for an integration of all major state, and county activities.

The *Hawai'i State Plan* is a policy document. It depends on implementing laws and regulations to achieve its goals. While not all sections of the *Hawai'i State Plan* are directly applicable to the Proposed Action, it does directly address objectives and policies for facility systems-energy; the most relevant are below.

> *§226-18 Objective and policies for facility systems--energy. (c) To further achieve the energy objectives, it shall be the policy of this State to:*
>
> *(1) Support research and development as well as promote the use of renewable energy sources;*
>
> *(7) Promote alternate fuels and transportation energy efficiency;*
>
> *(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector.*

Discussion: The proposed project is intended to inform the development of commercially viable SJF technology. This technology, once available, will allow for the creation of on-site jet fuel using sea water as its primary feed stock. While jet fuel does still produce greenhouse gas emissions when consumed, the ability to produce it on-site and without the need for lengthy storage and transport could radically reduce the total emissions, on a volume-for-volume basis, over conventionally produced jet fuel. Further, the Proposed Action is an R&D project, as called for under these objectives and policies, and represents a valuable step towards the development of alternative fuels and transportation energy efficiency.

The *Hawai'i State Plan* also establishes specific objectives and policies for land-based, shoreline, and marine resources in the physical environment:

§226-10 Objectives and policies for the economy—potential growth and innovative activities. (a) 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 Hawaii's economic base.

(b) To achieve the potential growth and innovative activity objective, it shall be the policy of this State to:

(1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaii's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors;

(7) Enhance and promote Hawaii's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts;

(8) Accelerate research and development of new energy-related industries based on wind, solar, ocean, underground resources, and solid waste;

(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research;

(16) Foster the research and development of nonfossil fuel and energy efficient modes of transportation.

The *Hawai'i State Plan* also establishes specific objectives and policies for land-based, shoreline, and marine resources in the physical environment:

§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources. (a) 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:

(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.

(2) Effective protection of Hawaii's unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

> *(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.*
>
> *(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.*
>
> *(8) Pursue compatible relationships among activities, facilities, and natural resources.*
>
> *(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.*

Discussion: The proposed project and NELHA's HOST Park have been conceived and developed to carefully steward land-based, shoreline, and marine resources. The nature and scope of the Proposed Action are intended to advance prudent management and use of ocean resources, in this case by conducting research activities using sea water as the primary feedstock to produce jet fuel. By proposing to site the proposed project at HOST Park, SDEI is taking advantage of a site originally intended and developed for emerging renewable and ocean-based technologies and where the potential for adverse impacts has already been carefully evaluated by the State of Hawai'i. Furthermore, SDEI has avoided many possible impacts by proposing to use a site that has already been developed.

In addition, the use of HOST Park for this undertaking is in harmony with NELHA's mission to develop and diversify the State's economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner. Finally, SDEI will, through the avoidance, minimization, and mitigation measures outlined in Chapter 3, eliminate the potential for adverse impacts to sensitive inland, shoreline, and marine resources. Based on these considerations, SDEI has determined that the Proposed Action is consistent with these objectives and policies of the *Hawai'i State Plan* related to prudent management and use of natural resources.

4.1.2 HAWAI'I 2050 SUSTAINABILITY PLAN

The *Hawai'i 2050 Sustainability Plan* is a blueprint for Hawai'i's preferred future. It is the most comprehensive planning process since the *Hawai'i State Plan* was developed over four decades ago and was most recently updated in 2018. The *Hawai'i 2050 Sustainability Plan* posits five (5) goals for the State of Hawai'i in 2050 and are intended to be integrated philosophies that express a vision of a sustainable future and reflect a deeply held sense of where Hawai'i should be headed; they are:

> *Goal 1 – Living sustainably is part of our daily practice in Hawai'i.*
>
> *Goal 2 – Our diversified and globally competitive economy enables us to meaningfully live, work and play in Hawai'i.*
>
> *Goal 3 – Our natural resources are responsibly and respectfully used, replenished and preserved for future generations.*
>
> *Goal 4 – Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need.*

> *Goal 5 – Our Kānaka Maoli and island cultures and values are thriving and perpetuated.*

Based on these five goals, the *Hawai'i 2050 Sustainability Plan* goes on to adopt specific strategic actions to implement them, and indicators to measure their respective success or failure. Considered together, the *Hawai'i 2050 Sustainability Plan*'s goals identify what it hopes to achieve, the strategic actions characterize the paths to achieving the Plan's goals, and the indicators serve to measure progress along the way. While not all the goals of the *Hawai'i 2050 Sustainability Plan* are applicable to the Proposed Action, the specific goal most directly tied to it is Goal 3, relating to responsible and respectful management of Hawai'i's natural resources.

The Plan presents a range of Strategic Actions dealing with effective management of the State's natural resources. Fossil fuels are dealt with under Strategic Action 1 – Reduce Reliance on Fossil (Carbon-based) Fuels. The Plan's discussion of this Strategic Action specifically notes that 95 percent of Hawai'i's primary energy supply is imported fossil fuel that contributes to global warming and the deterioration of its environment and concludes that:

> *"We must reduce our reliance on fossil fuels by expanding renewable energy opportunities. We must rethink how we use energy by improving efficiencies in all that we do."*

Discussion: The proposed project is consistent with the *Hawai'i 2050 Sustainability Plan*'s applicable provisions (see Goal 3, Strategic Action 1, relating to reducing reliance on fossil fuels) by expanding renewable energy opportunities. The Proposed Action will further this Goal and its Strategic Action by conducting R&D on an SJF process, developing new sources of chemical potential energy that do not rely on fossil fuels. For these reasons, SDEI has concluded that the Proposed Action, while not interfering with the ability to achieve the other goals in the *Hawai'i 2050 Sustainability Plan*, is consistent with and advances the *Hawai'i 2050 Sustainability Plan*'s goal of pursuing opportunities to reduce reliance on fossil fuels and addressing the challenges of climate change.

4.1.3 HAWAI'I LAND USE LAW; HRS § 205

HRS § 205 established the State Land Use Commission and gives this body the authority to designate all lands in the State as Urban, Rural, Agricultural, or Conservation District. The proposed project is in the State's Urban Land Use District. The counties make all land use decisions within the Urban District in accordance with their respective county general plans, development plans, and zoning ordinances. HAR § 15-15-18 characterizes the Urban Land Use District as exhibiting "city-like" concentrations of people, structures, streets, with an urban level of services and other related land uses. It also stresses the importance of ensuring availability of basic services and utilities in urban areas.

Discussion: The Proposed Action is consistent with the land uses envisioned for the State Land Use Urban District. It is an industrial operation that benefits a "city-like" concentration of similar uses. Consequently, SDEI has concluded that the Proposed Action is an appropriate land use in the Urban Land Use District.

4.1.4 COASTAL ZONE MANAGEMENT PROGRAM, HRS § 205A

The objectives of the Hawai‘i Coastal Zone Management (CZM) Program are set forth in HRS § 205A. The State Office of Planning and Sustainable Development administers Hawai‘i’s CZM Program. The program is intended to promote the protection and maintenance of valuable coastal resources. All lands in Hawai‘i are classified as valuable coastal resources. A general discussion of the proposed project’s consistency with the objectives and policies of Hawai‘i’s CZM Program follows.

4.1.4.1 Recreational Resources

Objective: *Provide coastal recreational opportunities accessible to the public*.

Policies:

A) Improve coordination and funding of coastal recreational planning and management; and

B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

ii) Requiring restoration of coastal resources that have significant recreational and ecosystem value, including but not limited to coral reefs, surfing sites, fishponds, sand beaches, and coastal dunes, when these resources will be unavoidably damaged by development; or requiring monetary compensation to the State for recreation when restoration is not feasible or desirable;

iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources,

and county authorities; and crediting that dedication against the requirements of section 46-6.

Discussion: The proposed project is on a State-owned parcel in North Kona under the control of NELHA. There are no parks or public recreational resources within the project vicinity; the closest public parks, Wāwāloli Beach Park and Kohanaiki Beach Park, are located over half a mile to the west. The Proposed Action will have no impact on any existing shoreline access, open space, or coastal recreational opportunities. No development is proposed in the shoreline setback area nor will any work occur on any shoreline lot. Therefore, the proposed project is unlikely to have any adverse impact on coastal recreational resources.

4.1.4.2 Historic Resources

Objective: *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.*

Policies:

A) Identify and analyze significant archaeological resources;

B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: Section 3.6 of this report assesses the potential for impacts to historic and cultural resources. The collective finding of those reviews and assessments is that no historic properties will be affected by the proposed project. SDEI will coordinate with SHPD to the extent necessary and continue to coordinate with cultural stakeholders during the EA process and then, during construction and operations, by participating in NELHA's community programs and advisory groups. The proposed project includes the appropriate protocols in the unlikely event that historic resources are encountered during project implementation (Section 3.6.1.4).

4.1.4.3 Scenic and Open Space Resources

Objective: *Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.*

Policies:

CZM policies related to scenic and open space are:

A) Identify valued scenic resources in the coastal zone management area;

B) Ensure that new developments are compatible with their visual environment by designing and locating those developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: As discussed in Section 3.8, SDEI's small R&D unit will be placed in an existing warehouse at a facility in HOST Park intended for this type of use, and where views are precluded by intervening topography, vegetation, and structures. Consequently, the proposed project is not anticipated to have any significant adverse impact on any valued scenic resources identified in any State or County planning document(s).

4.1.4.4 Coastal Ecosystems

Objective: *Protect valuable coastal ecosystems, including reefs, beaches, and coastal dunes from disruption, and minimize adverse impacts on all coastal ecosystems.*

Policies:

CZM policies related to coastal ecosystems are:

A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

B) Improve the technical basis for natural resource management;

C) Preserve valuable coastal ecosystems of significant biological or economic importance, including reefs, beaches, and dunes;

D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: As discussed in detail in Section 3.5, SDEI has determined that there is no federally designated critical habitat within, or in the immediate vicinity, of the project site. That section provides a detailed discussion of biota present in the region, potential impacts resulting from implementation of the Proposed Action, and measures to avoid and minimize the potential for the project to adversely affect protected species.

4.1.4.5 Economic Uses

Objective: *Provide public or private facilities and improvements important to the State's economy in suitable locations.*

Policies:

CZM policies related to economic uses are:

A) Concentrate coastal dependent development in appropriate areas;

B) Ensure that coastal dependent development and coastal related development are located, designed, and constructed to minimize exposure to coastal hazards and adverse social, visual, and environmental impacts in the coastal zone management area; and

C) Direct the location and expansion of coastal development to areas designated and used for that development and permit reasonable long-term growth at those areas, and permit coastal development outside of designated areas when:

i) Use of designated locations is not feasible;

ii) Adverse environmental effects and risks from coastal hazards are minimized; and

iii) The development is important to the State's economy.

Discussion: The Proposed Action will not encourage new coastal development in any way. The proposed project is located well away from the coastline and does not directly abut any shoreline properties. The proposed project does not encourage or support expanded development in the area. The R&D unit and associated infrastructure is located at an existing facility outside of special coastal hazard areas; it will be outside of the Tsunami Inundation Zone and designed in such a way as to minimize exposure to coastal hazards and adverse social, visual, and environmental impacts in the coastal zone management area.

4.1.4.6 Coastal Hazards

Objective: *Reduce hazard to life and property from coastal hazards.*

Policies:

CZM policies related to coastal hazards are:

A) Develop and communicate adequate information about the risks of coastal hazards;

B) Control development, including planning and zoning control, in areas subject to coastal hazards;

C) Ensure that developments comply with requirements of the National Flood Insurance Program; and

D) Prevent coastal flooding from inland projects.

Discussion: As discussed in detail in Section 3.7, the Proposed Action is well inland of most coastal hazards. All proposed new infrastructure is outside of designated hazard zones including any floodway or special flood hazard area. The proposed infrastructure will be in Flood Zone X, outside the 100-year area of coastal flooding. The Proposed Action will not increase the vulnerability of the area to the effects of coastal floodings, nor is it anticipated to have any deleterious effects on coastal hazards or emergency response when such hazards occur. Consequently, SDEI has concluded that the Proposed Action is consistent with the CZM policies related to coastal hazards.

4.1.4.7 Managing Development

Objective: *Improve the development review process, communication, and public participation in the management of coastal resources and hazards.*

Policies:

CZM policies related to managing development are:

> *A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;*
>
> *B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and*
>
> *C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.*

Discussion: The Proposed Action complies with applicable laws and policies regarding coastal development. Chapter 6 of this EA details the outreach conducted to date. SDEI will continue to work cooperatively with all government agencies with oversight responsibilities to facilitate efficient processing of permits and informed decision-making by the responsible parties.

4.1.4.8 Public Participation

Objective: *Stimulate public awareness, education, and participation in coastal management.*

Policies:

CZM policies related to public participation are:

> *A) Promote public involvement in coastal zone management processes;*
>
> *B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and*
>
> *C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Discussion: This EA has been prepared to disclose potential short-term and long-term impacts of the proposed improvements to interested individuals, organizations, and agencies. A notice of availability for the Draft EA will be published in the Office of Planning and Sustainable Development, ERP's bi-monthly bulletin, *The Environmental Notice* with a request for review and comment.

4.1.4.9 Beach and Coastal Dune Protection

Objective: *(A) Protect beaches and coastal dunes for: (i) public use and recreation; (ii) the benefit of coastal ecosystems; and (iii) use as natural buffers against coastal hazards; and (B) Coordinate and fund beach management and protection.*

Policies:

CZM policies related to beaches and coastal dunes are:

> *A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;*
>
> *B) Prohibit construction of private shoreline hardening structures, including seawalls and revetments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities;*
>
> *C) Minimize the construction of public shoreline hardening structures, including seawalls and revetments, at sites having sand beaches and at sites where shoreline hardening structures interfere with existing recreational and waterline activities;*
>
> *D) Minimize grading of and damage to coastal dunes;*
>
> *E) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and*
>
> *F) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.*

Discussion: The proposed project will not have any impact on area beaches and coastal dunes. The project area is over half a mile from the shoreline or sand deposits; the site is entirely composed of lava flows (Section 3.2.3). The Proposed Action will not locate any new structures within the shoreline area, nor will it harden any shoreline. Neither construction nor operation of the proposed R&D unit and its supporting infrastructure will interfere with existing recreational activities. No portion of the project will be located within a beach transit corridor, nor will it interfere with or encroach upon any beach transit corridor.

4.1.4.10 Marine and Coastal Resources

Objective: *Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*

Policies:

CZM policies related to marine resources are:

> *A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*

B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

D) Promote research, study, and understanding of ocean and coastal processes, impacts of climate change and sea level rise, marine life, and other ocean resources to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: The proposed project is in HOST Park, which was established with this objective and associated policies in mind. Uses consistent with the purpose of HOST Park are consistent with this objective and its policies. The development of the marine and coastal resources, such as sea water supply lines, was performed when HOST Park was established. HOST Park now provides an ideal setting for businesses and organizations, such as SDEI, to use the marine resources while minimizing their impacts on the environment. The R&D focus of the proposed project speaks directly to the CZM policies.

4.1.5 NELHA's Mission, Purpose, and Development and Design Guidelines

Act 236, adopted by the State Legislature in 1974, established the Natural Energy Laboratory of Hawai‘i (NELH) at Keāhole (North Kona, Hawai‘i) to provide essential support facilities for future R&D of alternative energy resources. In 1984, the State Legislature set aside an additional 547 acres of land adjacent to NELH for the commercial expansion of successful NELH research projects. This area was called HOST Park. In 1990, the legislature combined NELH and HOST Park into the NELHA.

The legislation that established NELHA (HRS 227D-2) states, "The purpose of the natural energy laboratory of Hawai‘i authority shall be to facilitate research, development, and commercialization of natural energy resources and ocean-related research, technology, and industry in Hawai‘i and to engage in retail, commercial, or tourism activities that will financially support that research, development, and commercialization at a research and technology park in Hawai‘i."

NELHA's mission is to, "To develop and diversify the Hawai‘i economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner."

NELHA's Development and Design Guidelines (https://nelha.hawaii.gov/wp-content/uploads/2020/03/NELHA_Dev_Des_Guidelines_Final_Nov11.pdf) establish "standards, restrictions and guidelines that will ensure a high quality of coordinated development and a minimum of adverse environmental impacts, while providing sufficient design and operating flexibility to encourage sound economic development."

Discussion: The proposed SDEI project is an R&D project that requires access to sea water to produce an energy product, jet fuel. The information obtained from the proposed R&D project may inform commercialization of a SJF technology that could contribute to meeting the energy demands of the future. The technologies being researched are intended to increase resiliency, support sustained renewable generation growth, and help address the challenges of climate change. As such, NELHA's purpose and mission fit the proposed R&D project like a glove.

During the scoping process (Section 6.2), some members of the community questioned whether the proposed project was appropriate at NELHA, primarily due to its association with the U.S. military (the R&D project is funded by ONR, as disclosed in Section 1.1). While SDEI and NELHA can appreciate a certain level of public apprehension regarding projects funded by an agency of the U.S. military, we offer the following to ameliorate these concerns:

- The proposed project will be conducted by a private business. Its staff will consist of civilian scientists and engineers.
- The site will be managed and secured in a manner like other businesses at HOST Park, it will not be a high security military installation. SDEI anticipates providing tours to interested community groups and engaging in outreach with the nearby school.
- There is a long history of technology transfer from military-funded research to civilian entities that benefit the public. While there are clear SJF technology applications within the military, there are also civilian interests and needs that the technology could address. For example, to meet Hawai‘i's energy and greenhouse gas goals when we rely heavily on air travel is a serious challenge. Furthermore, elements of the proposed R&D project may inform and advance related technologies, such as carbon capture and storage.
- NELHA and its former and current tenants have a long history of receiving funding from and working closely with federal entities, including branches of the military. A few examples are:
    - The Federal Energy Research and Development Agency was a major funder of NELHA soon after it was founded.
    - NELHA served as the National Defense Center of Excellence for Research in Ocean Sciences from 1995 to 2012.
    - Recent research related to ocean thermal energy conversion (OTEC) at NELHA was partially funded by ONR.

  The federal government has recognized that Hawai‘i, and NELHA in particular, provides an ideal location for federally supported research programs, that are often jointly pursued with the state, to develop ocean technologies for Department of Defense applications.

Lastly, per NELHA's Development and Design Guidelines, the project is a permitted use at HOST Park. Beyond that, the guidelines are generally not applicable to the proposed project because the project site is already developed. SDEI will not be modifying the exterior of the building or modifying other site developments, such as the security fence and driveway. SDEI will maintain the existing improvements as needed. The only exterior improvements proposed by SDEI are a 20-foot-tall low flow flare (Figure 3-6) and a rack for the storage of H_2 gas cylinders. Those

exterior additions will be designed to comply with the setback and other applicable stipulated in the guidelines. SDEI will also comply with other applicable elements of the guidelines, such as those related to water use and disposal.

4.2 HAWAI'I COUNTY

4.2.1 HAWAI'I COUNTY GENERAL PLAN (2005)

The purpose of the *Hawai'i County General Plan* (HCGP) is to provide a comprehensive, long-range document which guides development on the island of Hawai'i. Section 3.2 of the HCGP sets several relevant goals for energy and research and development:

The HCGP has several policies related to energy including R&D. In Section 3.3 Policies, it states:

> *Policy a*
>
> *Encourage the development of alternate energy resources.*
>
> *Policy c*
>
> *Encourage the expansion of energy research industry.*
>
> *Policy h*
>
> *Seek funding from both government and private sources for research and development of alternative energy resources.*
>
> *Policy i*
>
> *Coordinate energy research and development efforts of both the government and private sectors.*

Discussion: The Proposed Action is intended to pursue R&D to inform the development of a mobile and on-demand SJF production unit. The unit has the potential to increase resiliency by producing energy closer to users, support renewable generation growth, and help address climate change challenges. SDEI will be using federal funding for the project, which will be sited on state land. Thus, the proposed project is supportive of, and actively promotes, these policies of the *Hawai'i County General Plan*.

4.2.2 KONA COMMUNITY DEVELOPMENT PLAN (2019, AMENDED)

The purpose of the KCDP is to address each element of the HCGP as they apply to the district of Kona. This includes a combination of land-use amendments, policies, budgetary items, public-private partnership building, and community-based implementation activities that are needed to accomplish many kinds of goals. Consistent with HCGP policies, the KCDP identifies in Section 4.8.2:

> ***(a) Energy industry.*** *With NELHA as a catalyst, the policies encourage the development of renewable and distributed energy endeavors.*
>
> ***(f) Workforce Development and Innovation.*** *The new West Hawai'i University or community college would synergize with NELHA, the hospital, and the Design Center to provide training opportunities for*

> *Kona's upcoming generation and, thereby, also attract new businesses. With partnerships established among other universities with expertise in emerging technology, engineering, and science, the university can stimulate innovative applications in the business arena.*

The KCDP recognizes NELHA as a strategic public facility and business opportunity for economic stimulation in Policy ECON-1.3:

> ***NELHA as Stimulus for Energy and Research Industry.*** *NELHA has paradoxical missions: is it a research institution that requires State subsidy or a self-sustaining commercial operation. Are the diverse uses of the cold, pristine, deep ocean water its focus or is the innovative energy research that may use the deep ocean water or other ocean resources as well as non-ocean energy research its focus. The Kona CDP encourages the State and NELHA's board of directors to balance NELHA's complex mission in order to make it a world-class renewable energy research center with close ties to the proposed West Hawai'i University. To offset research subsidies, the plan supports commercial development of the mauka NELHA area by businesses incubated at the NELHA's research area. The proposed frontage road would provide convenient access by residents and visitors to this proposed commercial area.*

The KCDP and the County of Hawai'i General Land Use Pattern Allocation Guide Map include the NELHA site within their designated urban area. The proposed project is within the area zoned for industrial use.

Discussion: The proposed project is intended to encourage the development of a new, renewably resourced SJF technology at HOST Park. This type of advanced, renewable, and distributed energy technology is precisely oriented to NELHA's mission, as characterized by the KCDP. By implementing the proposed project at HOST Park, which is the mauka campus identified in the KCDP, SDEI will support NELHA's goal of making the entity a self-sustaining commercial operation funded by income from tenant businesses. In view of the foregoing, SDEI has concluded that the project is consistent with these policies of the KCDP.

4.2.3 HAWAI'I COUNTY SPECIAL MANAGEMENT AREA

The project parcel and project site are within the County of Hawai'i SMA. The SMA program is a companion of the State's CZM Project, which is discussed in Section 4.1.4. NELHA holds SMA permit number 239 which allows alternate energy R&D, among other research and commercial activities associated with NELHA's access to shallow and deep ocean water in HOST Park. In its letter dated February 14, 2024 (Appendix A), the County of Hawai'i Planning Department states that "The project's proposed activities are … uses and activities authorized by the SMA permit [number 239]."

4.2.4 HAWAI'I COUNTY CODE, CHAPTER 25 ZONING

The purpose of County of Hawai'i's Zoning Ordinance, contained in Hawai'i County Code (HCC), Chapter 25, is to regulate land use in a matter that encourages orderly development in accordance with adopted land use policies, including the HCGP and the KCDP. These standards govern the location, height, area, and siting of structures, yard areas, off-street parking facilities, and open

spaces, and the use of structures and land for agriculture, industry, business, residences, and other purposes.

Discussion: The site has been designated as being in the MG-1a General Industrial District by the County of Hawai‘i. Per HCC, § 25-5-150, the MG General Industrial District is applied to areas, “for uses that are generally considered to be offensive or have some element of danger.” With its R&D focus, the Sea Dragon Energy Project is an allowable and appropriate use of the project site. In its letter dated February 14, 2024 (Appendix A), the County of Hawai‘i Planning Department states that “The project’s proposed activities are consistent with the permitted uses of the MG district.”

5 ANTICIPATED DETERMINATION

5.1 SIGNIFICANCE CRITERA

HAR § 11-200.1-14 establishes procedures for determining if an Environmental Impact Statement (EIS) should be prepared or if a Finding of No Significant Impacts (FONSI) is warranted. HAR § 11-200.1-14(d) provides that proposing agencies should issue an EIS preparation notice for actions that it determines may have a significant effect on the environment. HAR § 11-200.1-13(b) lists the following criteria to be used in making that determination.

In most instances, an action shall be determined to have a significant effect on the environment if it:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;
2. Curtails the range of beneficial uses of the environment;
3. Conflicts with the State's long-term environmental policies or goals as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;
4. Substantially affects the economic or social welfare of the community or State;
5. Substantially affects public health;
6. Involves substantial secondary impacts, such as population changes or effects on public facilities;
7. Involves a substantial degradation of environmental quality;
8. Is individually limited but cumulatively has considerable effect on the environment or involves a commitment for larger actions;
9. Substantially affects a rare, threatened, or endangered species, or its habitat;
10. Detrimentally affects air or water quality or ambient noise levels;
11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;
12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies; or,
13. Requires substantial energy consumption.

5.2 FINDINGS

The potential effects of the Proposed Action were evaluated relative to these 13 significance criteria. SDEI's findings with respect to each criterion are summarized in the following subsections.

5.2.1 IRREVOCABLE LOSS OR DESTRUCTION OF VALUABLE RESOURCE

The area that will be used by the proposed project is within an existing, developed industrial site that is part of HOST Park. No new major structures, land disturbances, or substantial new outdoor equipment are proposed. The placement and operation of the R&D unit does not represent an irrevocable loss of a resource. The water employed will be returned to the environment and even the components of the jet fuel produced will ultimately be returned to their components, primarily CO_2 and H_2O. As discussed in Section 2.1.6, the project improvements will be decommissioned and removed when its operation is discontinued (approximately 2 to 5 years after the start operations).

5.2.2 CURTAILS BENEFICIAL USES

The project will serve as an R&D platform for the testing and advancement of SJF technology. It will occupy a previously developed industrial site within HOST Park located in the State's Urban Land Use District and the County of Hawai'i's General Industrial District. As such, it is an appropriate use of the site, compatible with adjacent uses, and consistent with the overall mission of NELHA and HOST Park. The project is a continuation of the long-standing industrial use of the project site and will not curtail other beneficial uses of the area.

5.2.3 CONFLICTS WITH LONG-TERM ENVIRONMENTAL POLICIES OR GOALS

As discussed in Chapter 4, the Proposed Action is consistent with applicable plans, policies, and controls, including the *Hawai'i State Plan* and the HCGP. Further, the project is consistent with the State of Hawaii's long-term environmental policies and goals, as expressed in HRS, Chapter 344 and elsewhere in state law.

5.2.4 SUBSTANTIALLY AFFECTS ECONOMIC OR SOCIAL WELFARE

The Proposed Action will not have substantial effects on economic or social welfare. Its purpose is to allow for R&D in an existing facility located within HOST Park. Over time, the technology developed downstream of the R&D effort could yield substantial economic and social benefits.

5.2.5 PUBLIC HEALTH EFFECTS

The Proposed Action will not significantly affect air or water quality. It will not generate other emissions that will have a significant adverse effect on public health.

5.2.6 PRODUCE SUBSTANTIAL SECONDARY IMPACTS

As discussed in Section 3.12 the proposed project will not produce any substantial secondary impacts. It will not foster population growth, promote economic development, or unduly burden public facilities or services. It is not intended to promote any secondary development or serve as an incremental contribution to a larger undertaking which could lead to unanticipated secondary impacts. The project is solely intended to conduct R&D at HOST Park, taking advantage of existing facilities.

5.2.7 Substantially Degrade the Environment

As discussed throughout Chapter 3, the proposed project will not have substantial adverse environmental effects. Construction will temporarily elevate noise levels and generate traffic, but these impacts will be localized, minor, and short in duration.

5.2.8 Cumulative Effects of Commitment to a Larger Action

As noted in Section 3.11, the proposed project does not represent a commitment to a larger action and is not intended to facilitate substantial economic or population growth. It is solely intended to allow for R&D related to SJF technology.

5.2.9 Effects on Rare, Threatened, or Endangered Species

As discussed in Section 3.5, no rare, threatened, or endangered species are known to utilize the project site, and no activities are contemplated that would pose a threat to rare, threatened, or endangered species, or their designated critical habitat. In addition, the project does not utilize any resource or habitat needed for the protection of rare, threatened, or endangered species. Measures outlined in Section 3.5.3 will be implemented to avoid and minimize potential effects to rare, threatened, or endangered species.

5.2.10 Affects Air or Water Quality or Ambient Noise Levels

Minor air emission, under the threshold that would trigger a permit, would result from the proposed process and be controlled by the low flow flare (3.2.2). The combination of sea and fresh water utilized by the R&D unit will be discharged to the on-site sea water disposal sump. As discussed in detail in Section 3.4.2, this discharge is not anticipated to have an adverse effect on water quality.

5.2.11 Environmentally Sensitive Area

As discussed in Section 3.7, the project site is in an area with the potential for volcanic and seismic risks, which characterize the entire island. The proposed project does not affect, nor will it likely be damaged as a result, of being in an environmentally sensitive area. The site is over a half a mile from the shoreline, is outside flood hazard zones, and is outside the tsunami evacuation area.

5.2.12 Affects Scenic Vistas and View Planes

As discussed in Section 3.8, there are no identified scenic vistas or viewplanes on the project site. The proposed project will occur at a developed site within an existing facility. The proposed project will not have an adverse effect on scenic vistas or viewplanes identified for protection in any State or County plan.

5.2.13 Requires Substantial Energy Consumption

The peak demand for power will be roughly 0.5 MW, which is not considered substantial. SDEI has been engaged in dialogue with both NELHA and Hawaiian Electric and have received assurances that both the power supply and infrastructure are adequate to meet this demand without modification.

5.3 ANTICIPATED DETERMINATION

In view of the foregoing significance criteria, SDEI's draft assessment is that the Proposed Action will not have a significant adverse impact on the environment. Consequently, it is anticipated that the NELHA will issue a FONSI.

6 CONSULTATION AND DISTRIBUTION

6.1 EARLY CONSULTATION

Pursuant to HAR § 11-200.1-18(a), SDEI has sought to:

> *"Conduct early consultation seeking, at the earliest practicable time, the advice and input of the county agency responsible for implementing the county's general plan for each county in which the Proposed Action is to occur, and consult with other agencies having jurisdiction or expertise as well as those citizen groups and individuals that the proposing agency or approving agency reasonably believes may be affected."*

On January 11, 2024, Planning Solutions, Inc. (PSI), acting on behalf of SDEI, sent scoping letters to relevant agencies and organizations. All responses received were carefully considered during the preparation of this report. The early consultation letter and all comments received are contained in Appendix A.

6.2 EARLY CONSULTATION

Pursuant to HAR 11-200.1-18(a), SDEI has sought to:

> *"conduct early consultation seeking, at the earliest practicable time, the advice and input of the county agency responsible for implementing the county's general plan for each county in which the proposed action is to occur, and consult with other agencies having jurisdiction or expertise as well as those citizen groups and individuals that the proposing agency or approving agency reasonably believes may be affected."*

6.2.1 SCOPING LETTERS

On January 11, 2024, PSI, acting on behalf of SDEI, sent pre-assessment consultation/scoping emails and letters to various federal and state agencies, NHOs, and select NELHA tenants identified in Table 6-1. The scoping letter was distributed to 50 entities with the intent of soliciting input on the proposed project to help inform the EA. A total of nine (9) responses were received and considered during the preparation of this EA. The early consultation letter and all responses are contained in Appendix A.

Table 6-1: Scoping Letter Recipients

Level	*Department*	*Division*	*Recipient*	*Response*
Federal	Interior	Fish and Wildlife Service	Pacific Islands Fish and Wildlife Office	--
Federal	Commerce	National Oceanic and Atmospheric Administration	National Marine Fisheries Service	--
Federal	Interior	National Park Service	Laura Joss, Regional Director	--

Level	*Department*	*Division*	*Recipient*	*Response*
Federal	Interior	Kaloko-Honokōhau National Historical Park	Superintendent	--
State of Hawai‘i	Department of Transportation	Ellison Onizuka Kona International Airport at Keāhole	Chauncey Wong Yuen, Hawai‘i District Manager	--
State of Hawai‘i	Department of Transportation		Ed Sniffen, Director	--
State of Hawai‘i	Department of Business, Economic Development & Tourism		James Kunane Tokioka, Director	--
State of Hawai‘i	DBEDT - Office of Planning and Sustainable Development		Mary Alice Evans, Diretor	--
State of Hawai‘i	Department of Defense		Major General Kenneth Hara	--
State of Hawai‘i	Department of Hawaiian Home Lands		Kali Watson, Chairman	--
State of Hawai‘i	Department of Health, Environmental Health Services Branch		Lynn Nakasone, Chief	--
State of Hawai‘i	Department of Health	Clean Air Branch		Yes
State of Hawai‘i	DLNR	Land Division	Russell Tsuji, Administrator	Yes
State of Hawai‘i	Office of Hawaiian Affairs	--	Colin Kippen, Interim CEO	--
County of Hawai‘i	Department of Environmental Management	--	Ramzi I. Mansour, Director	--
County of Hawai‘i	Hawai‘i Fire Department	--	Kazuo S.K.L. Todd, Fire Chief	--
County of Hawai‘i	Parks & Recreation	--		--
County of Hawai‘i	Planning Department	--	Zendo Kern, Director	Yes
County of Hawai‘i	Police Department	--	Chief Benjamin Moszkowicz	Yes
County of Hawai‘i	Department of Public Works	--	Steve Pause, P.E.	--
County of Hawai‘i	Research & Development	--		--
County of Hawai‘i	Office of the Mayor		Mayor Mitch Roth	--
County of Hawai‘i			Kirstin Kahaloa, House District 6	
County of Hawai‘i			Nicole E. Lowen, House District 7	
County of Hawai‘i			Dru Mamo Kanuha, Senate District 3	

Level	*Department*	*Division*	*Recipient*	*Response*
County of Hawai‘i			Herbert M. “Tim” Richards, III, Senate District 4	
Native Hawaiian Organization	La‘i‘ōpua Community Development Corporation	--	Craig “Bo” Kahui, Executive Director	--
Native Hawaiian Organization	Aha Moku, Moku o Keawe	--	Charles Young	--
Native Hawaiian Organization	Hawai‘i State Aha Moku	--	Leimana DaMate, Executive Director	--
Native Hawaiian Organization		--	Shane Palacat-Nelsen	--
Native Hawaiian Organization	Kona Hawaiian Civic Club	--		--
Organization	Surfrider Foundation's Kona Kai Ea Chapter	--		--
Organization	Kona-Kohala Chamber of Commerce	--		--
Organization	The Nature Conservancy	--	Ulalia Woodside, State Director	--
Organization	Sierra Club Moku Loa Group	--		--
Organization	The Kohala Center	--	Cheryl Kauhane Lupenui	--
Organization	Hawaii Island Economic Development Board	--	Jacqui Hoover	--
Utility	Hawaiian Electric	--		--
Tenant	Apparent, Inc.	--	Stefan Matan	--
Tenant	Kowa Premium Foods Hawai‘i Corp. (DBA: Big Island Abalone Corporation)	--	Taishi Kurihara, CFO Satoshi Yoshida, COO Jay Booth, Director of Production	--
Tenant	Blue Ocean Mariculture	--	Robin Coonen, Controller	--
Tenant	Kona Deep Corporation	--	Bill Carey, CEO	--
Tenant	Terraformation, Inc.	--	Kate Logan, Head of Business Development, Kimberly De Souza, Johannes Seidel, Head of Forestry	Yes
Tenant	Koyo USA Corp	--	Larry Visocky, Chief Plant Officer	--
Tenant	Moana Technologies LLC	--	Ester Tolentino, General Manager	--
Tenant	West Hawaii Explorations Academy	--	Joseph Greenberg, Director	--

Source: Compiled by Planning Solutions, Inc. (2024)

Comment letters were received from individuals that PSI did not mail a scoping letter to. Copies of those letter are also provided in Appendix A.

6.2.2 SUMMARY OF SCOPING COMMENTS

The following is a summary of the feedback received during the scoping process; the complete comments are provided in Appendix A:

- The Hawai‘i County Planning Department stated that the project appeared to be ideal for its proposed location at HOST Park, it was an approved use under an existing SMA permit, and that no other permits would be required unless a new building or an extension of the existing building was proposed.
- The HDOH, CAB stated that the project is exempt, as defined in HAR 11-60.1-62(d), from air permitting requirements.
- The DLNR Land Division – Hawai‘i District Office stated no objections to the project, as did the Hawai‘i County Police Department. The DLNR Office of Conservation and Coastal Lands noted that the project is not in the Conservation District and outside of their jurisdiction.
- Alexia Akbay, Haeleigh Grajo, Amanda Pavese, and Lois Taylor, employees of Symbrosia, Inc., expressed opposition to the project. Central objections included but were not limited to: (*i*) the perception that the project is not aligned with NELHA’s mission, (*ii*) may be used by the U.S. military, (*iii*) has the potential to use excessive quantities of fresh water, and (*iv*) may adversely impact other tenants at HOST Park, including West Hawai‘i Explorations Academy Public Charter School.
- Bryant De Groot, identifying himself as a Kānaka maoli living on the mainland, objected to the project, stating that too much land and fresh water was being misused by private interests.
- Stephen Holmes commented that it was his opinion that the water discharge requires an NPDES permit. He also stated that an assessment of greenhouse gas emissions should include sources like Hawaiian Electric’s required power generation for the project, the energy use for pumping deep sea water, and the energy spent for hydrogen production.

6.2.3 ON-SITE MEETINGS

On February 14, 2023, a PSI representative met with individuals from NELHA, the West Hawai‘i Explorations Academy, Kowa Premium Foods (Big Island Abalone), and Terraformation. PSI discussed the project and reviewed the information in the scoping letter with the individuals that visited the site. Individuals attending were generally supportive of the project and asked questions about staff size, noise, security, the school’s use of the parking lot as an alternative meeting point in the event of an emergency, and fresh water use.

6.3 DISTRIBUTION OF THE DEA

SDEI has provided this EA to the parties listed in Table 6-2 with a request for review and comment.

Table 6-2: DEA Distribution List

Federal Agencies	**County of Hawai‘i**
U.S. Army Corps of Engineers, Honolulu District	Department of Water Supply
U.S. Fish and Wildlife Service, Pacific Islands Field Office	Department of Public Works
National Marine Fisheries Services	Department of Research & Development
National Park Service	Department of Environmental Management
Kaloko-Honokōhau National Historical Park	Office of Sustainability, Climate, Equity & Resilience
State Agencies	Department of Parks & Recreation
Department of Agriculture	Planning Department
Department of Agriculture, Agribusiness Development Corporation	Hawai‘i Mass Transit Agency
Department of Accounting and General Services	Hawai‘i Fire Department
Department of Business, Economic Development, and Tourism (DBEDT)	Hawai‘i Police Department
DBEDT, Hawai‘i State Energy Office	**Elected Officials**
DBEDT, Office of Planning and Sustainable Development	Governor Josh Green
Department of Defense	Mayor Mitch Roth
Department of Education	State Senator Dru Mamo Kanuha, District 3
Department of Hawaiian Home Lands	State Senator Herbert M. Richards, III, District 4
Department of Health (HDOH), Clean Air Branch	State Representative Kirstin Kahaloa District 6
HDOH, Clean Water Branch	State Representative Nicole E. Lowen, District 7
HDOH, Environmental Health Services Division	County Councilmember Rebecca Villegas, District 7
HDOH, Safe Drinking Water Branch	**Media**
HDOH, Wastewater Branch	West Hawai‘i Today
Department of Human Services	Hawaii Tribune-Herald
Department of Labor and Industrial Relations	Honolulu Star Advertiser
DLNR, Commission on Water Resource Management	Honolulu Civil Beat
DLNR, Land Division	**Organizations & Individuals**
Department of Transportation	La‘i‘ōpua Community Development Corporation
Office of Hawaiian Affairs	Aha Moku, Moku o Keawe
Ellison Onizuka Kona International Airport at Keāhole	Hawai‘i State Aha Moku
Utilities	Kona Hawaiian Civic Club
Hawai‘i Gas	Shane Palacat-Nelsen
Hawaiian Electric Light Co., Inc.	Surfrider Foundation's Kona Kai Ea Chapter
Hawaiian Telcom	Kona-Kohala Chamber of Commerce
Libraries and Depositories	The Nature Conservancy
Hawai‘i State Library Documents Center	Sierra Club Moku Loa Group
Kailua-Kona Public Library	The Kohala Center
Neighbors	Hawai‘i Island Economic Development Board
Koyo USA Corp	Alexia Akbay (Symbrosia, Inc.)
West Hawai‘i Explorations Academy	Haeleigh Grajo (Symbrosia, Inc.)
Kowa Premium Foods Hawai‘i Corp. (DBA Big Island Abalone Corp.)	Amanda Pavese (Symbrosia, Inc.)
Blue Ocean Mariculture	Lois Taylor (Symbrosia, Inc.)
Kona Deep Corporation	Bryant De Groot
Terraformation, Inc.	Stephen Holmes
Moana Technologies LLC	
Symbrosia Solutions	

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Appendix A. Early Consultation Letters and Responses

PLANNING SOLUTIONS

January 11, 2024

Subject: **Pre-Assessment Consultation**
Seawater-to-Jet Fuel Research & Development Project (SJF R&D)
Destiny Site, Hawai'i Ocean Science and Technology (HOST) Park,
Natural Energy Laboratory of Hawai'i Authority (NELHA)
Kailua-Kona, Island of Hawai'i
Tax Map Key 7-3-043:081

Dear Madam or Sir,

Sea Dragon Energy, Inc. (SDEI) is proposing to utilize the above-referenced site (Attachment 1) to conduct research and development (R&D) on a seawater-to-jet fuel (SJF) process. Planning Solutions, Inc. (PSI) is assisting SDEI with project planning. The purpose of this letter is to solicit input regarding SDEI's intent to build a small SJF R&D unit at the site and operate it for a minimum of 2 years.

Under contract with the Naval Research Laboratory (NRL), SDEI's R&D goals are to inform the development of a mobile and on-demand SJF production unit. A production unit has the potential to increase resiliency by producing energy closer to users, support renewable generation growth, and help address climate change challenges. The proposed R&D unit would build on recent feasibility studies and inform future production units.

The Destiny Site was previously used for bottling desalinated seawater and conducting research on health products derived from deep sea water. The site is developed. The proposed R&D unit would be placed within the existing warehouse space. No new buildings, substantial land disturbances, or substantial new outdoor equipment are proposed. SDEI would be responsible for decommissioning installed equipment at the completion of the R&D period.

The small R&D unit would require the following major inputs:

- Seawater, which would be obtained from NELHA's existing sea water infrastructure.
- Freshwater, which would be obtained from the NELHA's allocation from the Department of Water Supply.
- Hydrogen gas, which would likely be obtained from the Hawai'i Natural Energy Institute's production facility at HOST Park.
- Electricity, which would be obtained from Hawaiian Electric.

These inputs are available via existing service connections at the Destiny Site or, in the case of hydrogen gas, it could be delivered in cylinders from a nearby source within HOST Park.

The process would generate the following products and wastes:

- Small quantities of jet fuel, which would be tested, stored indoors with spill protection, and not allowed to accumulate more than 220 gallons.

Pacific Park Plaza, Suite 950 • 711 Kapi'olani Boulevard • Honolulu, Hawai'i 96813-5213
Phone: 808-550-4483 • www.psi-hi.com

- Water, which would be a mix of partially desalinated seawater and freshwater. The water would not contain pollutants and would be disposed of in the existing on-site seawater disposal sump.
- Inert gases that are byproducts of the process' effects on the water inputs that would be vented to the atmosphere.
- Gases that are byproducts of the fuel processing steps that would be directed to a small combustion device.[1]

The R&D unit would not operate continuously; therefore, the inputs, products, and wastes would not be needed or generated daily. The unit would operate in batches so that variables could be systematically adjusted, equipment gradually improved, and R&D goals achieved.

The proposed R&D project is consistent with the intended and permitted uses of HOST Park. HOST Park was created in 1974 by the State of Hawai'i to be a demonstration site for emerging renewable and ocean-based technologies. The park is administered by NELHA whose mission is to develop and diversify the Hawai'i economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner. NELHA holds a unique place in the Pacific for energy and distributed energy applied research, demonstration, test and evaluation, and deployment of clean energy technologies. It possesses an extraordinary combination of physical infrastructure and access to natural energy resources. As a result, the proposed site is an ideal location for the clean energy R&D proposed by SDEI.

We invite you to provide input regarding SDEI's proposed R&D project. Please submit your input by February 9, 2024, to:

Jim Hayes
Planning Solutions, Inc.
711 Kapi'olani Boulevard, Suite 950
Honolulu, HI 96813
jim@psi-hi.com
808-550-4559

Thank you for participating in the planning process for this proposal.

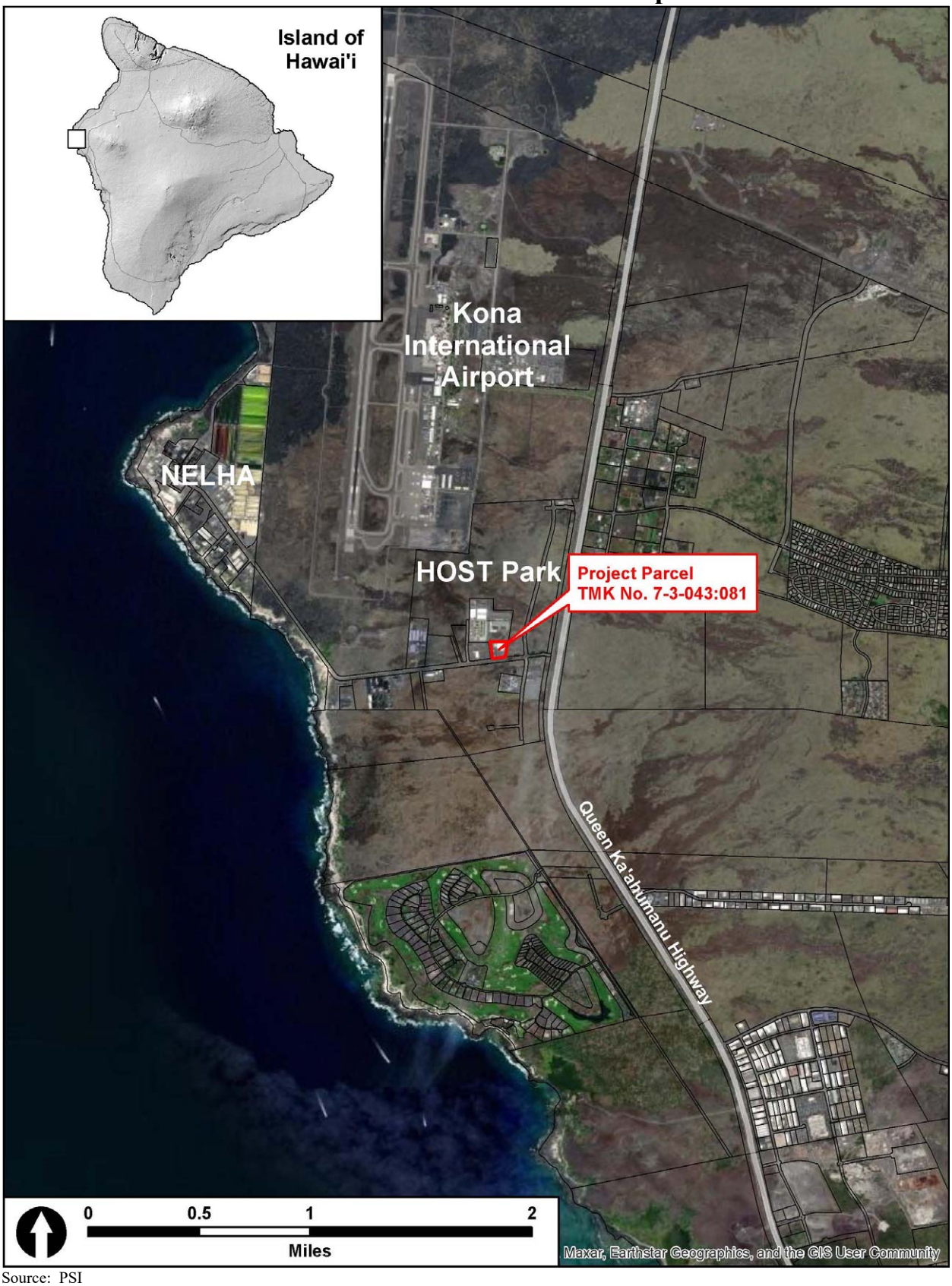
Sincerely,

Jim Hayes

Attachment

[1] The combustion device could be a low-profile thermal oxidizer. A combustion device is required to safely manage the small quantities of volatile organic gases that would be produced. The device would convert the gases to carbon dioxide, water, and heat.

Attachment 1. Location Map



Source: PSI

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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

P.O. BOX 621
HONOLULU, HAWAII 96809

February 9, 2024

Planning Solutions, Inc.
Attn: Ms. Julia Ham Tashima
711 Kapiolani Blvd., Ste. 950
Honolulu, Hawaii 96813

via email: julia@psi-hi.com

Dear Ms. Tashima:

SUBJECT: Pre-Assessment Consultation for the Proposed Seawater-to-Jet Fuel Research & Development Project located at the Destiny Site, Hawaii Ocean Science and Technology (HOST) Park, Natural Energy Laboratory of Hawaii Authority (NELHA), Kailua-Kona, Island of Hawaii; TMK: (3) 7-3-043:081 on behalf of **Sea Dragon Energy, Inc.**

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Office of Conservation & Coastal Lands and (b) Land Division-Hawaii District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

K St
HA-24-102

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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

P.O. BOX 621
HONOLULU, HAWAII 96809

January 11, 2024

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
___Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
___Aha Moku Advisory Committee

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: Pre-Assessment Consultation for the Proposed Seawater-to-Jet Fuel Research & Development Project

LOCATION: Destiny Site, Hawaii Ocean Science and Technology (HOST) Park, Natural Energy Laboratory of Hawaii Authority (NELHA), Kailua-Kona, Island of Hawaii; TMK: (3) 7-3-043:081

APPLICANT: Planning Solutions on behalf of **Sea Dragon Energy, Inc.**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **February 8, 2024.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

Project is outside of Conservation District

( ) We have no objections.
(X) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: Michael Cain
Print Name: Michael Cain
Division: OCCL
Date: 1-29-24

Attachments

2/1/24

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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

P.O. BOX 621
HONOLULU, HAWAII 96809

January 11, 2024

MEMORANDUM

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_X_ Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_ Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_ Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
___ Aha Moku Advisory Committee

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Pre-Assessment Consultation for the Proposed Seawater-to-Jet Fuel Research & Development Project
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APPLICANT: Planning Solutions on behalf of **Sea Dragon Energy, Inc.**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **February 8, 2024.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

(✓) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: _____
Print Name: GORDON C. HEIT
Division: Land Division
Date: 2/2/24

Attachments

Mitchell D. Roth
Mayor

Deanna S. Sako
Managing Director

Zendo Kern
Director

Jeffrey W. Darrow
Deputy Director

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

February 14, 2024

Jim Hayes,
Planning Solutions, Inc.
711 Kapi'olani Boulevard, Suite 950
Honolulu, HI 96813

Reference: Request for Zoning Determination and comments regarding Sea Dragon Energy project at NELHA Host Park, PL-INT-2024-006814
TMK: (3) 7-3-043:081

Dear Jim Hayes,

This letter is in response to your request for comment on proposed Sea Dragon Energy project at NELHA Host Park and zoning certification on the subject parcel, identified as TMK: (3) 7-3-043:08.

This letter confirms that, in accordance with Chapter 25 (Zoning) of the Hawaii County Code, the zoning classification for the subject parcel is General Industrial District (MG-1a). The subject parcel is designated Urban by the State Land Use Commission. And that NELHA has a Special Management Area (SMA) permit number 239. The project's proposed activities are consistent with the permitted uses of the MG district and the uses and activities authorized by the SMA permit.

This parcel is located within the Hawaii Ocean Science and Technology Park and the Natural Energy Laboratory of Hawaii Authority. This project appears to be ideal for the premise of this location. This project specifics that have been identified also shows the intent on linking various other HOST Park activities and materials.

No other permits are required to establish this project except a possible Plan Approval Application. This would only be required if there is any new building or extension of the existing building as part of the project.

Should you have any questions, please contact Deanne Bugado of our West Hawai'i Office at 323-4770.

Sincerely,

Zendo Kern
Zendo Kern (Feb 14, 2024 13:36 HST)
ZENDO KERN
Planning Director

DEB:deb
cc: West Hawai'i Office

Mitchell D. Roth
Mayor

Benjamin T. Moszkowicz
Police Chief

Reed K. Mahuna
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT
349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

February 2, 2024

Mr. Jim Hayes
Planning Solutions, Inc.
711 Kapi'olani Boulevard, Suite 950
Honolulu, HI 96813
jim@psi-hi.com

Aloha Mr. Hayes:

SUBJECT: PRE ASSESSMENT CONSULTATION
SEAWATER-TO-JET FUEL RESEARCH & DEVELOPMENT PROJECT (SFJ R&D) DESTINY SITE, HAWAI'I OCEAN SCIENCE AND TECHNOLOGY (HOST) PARK, NATURAL ENERGY LABORATORY OF HAWAI'I AUTHORITY (NELHA)
KAILUA-KONA, ISLAND OF HAWAI'I
TAX MAP KEY 7-3-043:081

This is in response to your letter dated January 11, 2024 regarding the above- referenced Pre-Assessment Consultation.

Staff has reviewed the proposed project and has no comments or objections to offer at this time.

Should you have any questions or concerns, please contact Captain Calvin Delaries, Jr., Commander of the Kona District, at (808) 326-4646, ext. 299, or via email at calvin.delaries@hawaiicounty.gov.

Sincerely,

BENJAMIN T. MOSZKOWICZ
POLICE CHIEF

CHAD BASQUE
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

CD/jaj
24HQ0050

PLANNING SOLUTIONS

July 10, 2024

Marianne Rossio, Branch Manager
Clean Air Branch
Department of Health
State of Hawai‘i
2827 Waimano Home Road, #130
Pearl City, HI 96782
Via Electronic Mail: cab@doh.hawaii.gov

Subject: **Pre-Assessment Consultation**
Seawater-to-Jet Fuel Research & Development Project (SJF R&D)
Destiny Site, Hawai‘i Ocean Science and Technology (HOST) Park,
Natural Energy Laboratory of Hawai’i Authority (NELHA)
Kailua-Kona, Island of Hawai‘i
Tax Map Key 7-3-043:081

Dear Ms. Rossio,

Sea Dragon Energy, Inc. (SDEI) is proposing to utilize the above-referenced site (Attachment 1) to conduct research and development (R&D) on a seawater-to-jet fuel (SJF) process. Planning Solutions, Inc. (PSI) is assisting SDEI with project planning, which includes the preparation of an Environmental Assessment (EA) per Hawai‘i Revised Statutes (HRS) Chapter 343. The purpose of this letter is to solicit input regarding SDEI’s need for permits or approvals from the Clean Air Branch (CAB).

Under contract with the Office of Navy Research (ONR), SDEI’s R&D goals are to inform the development of a mobile and on-demand SJF production unit. A production unit has the potential to increase resiliency by producing energy closer to users, support renewable generation growth, and help address climate change challenges. The proposed R&D unit would build on recent feasibility studies and inform future production units.

The Destiny Site was previously used for bottling desalinated seawater and conducting research on health products derived from deep sea water. The site is developed. The proposed R&D unit would be placed within the existing warehouse space. No new buildings, substantial land disturbances, or substantial new outdoor equipment are proposed. SDEI would be responsible for decommissioning installed equipment at the completion of the R&D period, which is anticipated to run roughly two years.

Pacific Park Plaza, Suite 950 • 711 Kapi‘olani Boulevard • Honolulu, Hawai‘i 96813-5213
Phone: 808-550-4483 • www.psi-hi.com

The proposed R&D project is consistent with the intended and permitted uses of HOST Park. HOST Park was created in 1974 by the State of Hawai‘i to be a demonstration site for emerging renewable and ocean-based technologies. The park is administered by NELHA whose mission is to develop and diversify the Hawai‘i economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner. NELHA holds a unique place in the Pacific for energy and distributed energy applied research, demonstration, test and evaluation, and deployment of clean energy technologies. It possesses an extraordinary combination of physical infrastructure and access to natural energy resources. As a result, the proposed site is an ideal location for the clean energy R&D proposed by SDEI.

Project Description

The small R&D unit would require the following major inputs:

- Seawater, which would be obtained from NELHA's existing sea water infrastructure.
- Freshwater, which would be obtained from the NELHA's allocation from the Department of Water Supply.
- Hydrogen gas, which may be obtained from the Hawai‘i Natural Energy Institute's production facility at HOST Park.
- Electricity, which would be obtained from Hawaiian Electric.

These inputs are available via existing service connections at the Destiny Site or, in the case of hydrogen gas, it could be delivered in cylinders from a nearby source within HOST Park.

The process would generate the following products and wastes:

- Small quantities of jet fuel, which would be tested, stored indoors with spill protection, and not allowed to accumulate more than 220 gallons.
- Water, which would be a mix of partially desalinated seawater and freshwater. The water would not contain pollutants and would be disposed of in the existing on-site water disposal sump.
- Inert gases that are byproducts of the process' effects on the water inputs that would be vented to the atmosphere.
- Gases that are byproducts of the fuel processing steps that would be directed to a small combustion device.[1] The gases from the fuel processing steps are the focus of this letter because they are the air pollutants that would be generated by the project.

[1] The combustion device could be a low-profile thermal oxidizer. A combustion device is required to safely manage the small quantities of volatile organic gases that would be produced. The device would convert the gases to carbon dioxide, water, and heat.

The R&D unit would not operate continuously; the inputs, products, and wastes would not be needed or generated daily. The unit would operate in batches so that variables could be systematically adjusted, equipment gradually improved, and R&D goals achieved.

Applicable Regulations

It is understood that a project that generates air pollutants may require a permit. Hawai‘i Administrative Rules (HAR) 11-60.1-62 addresses the applicability of the most likely air permit required by the proposed project, a noncovered source permit. HAR 11-60.1-62(d) lists air pollutant sources that are exempt from the this type of permit. The list includes “(1) Stationary sources with potential emissions of less than: (A) 500 pounds per year for each hazardous air pollutant, except lead; (B) 300 pounds per year for lead; (C) five tons per year of carbon monoxide; (D) 3,500 tons per year CO_2e for greenhouse gases; and (E) two tons per year of each regulated air pollutant not already identified above.”

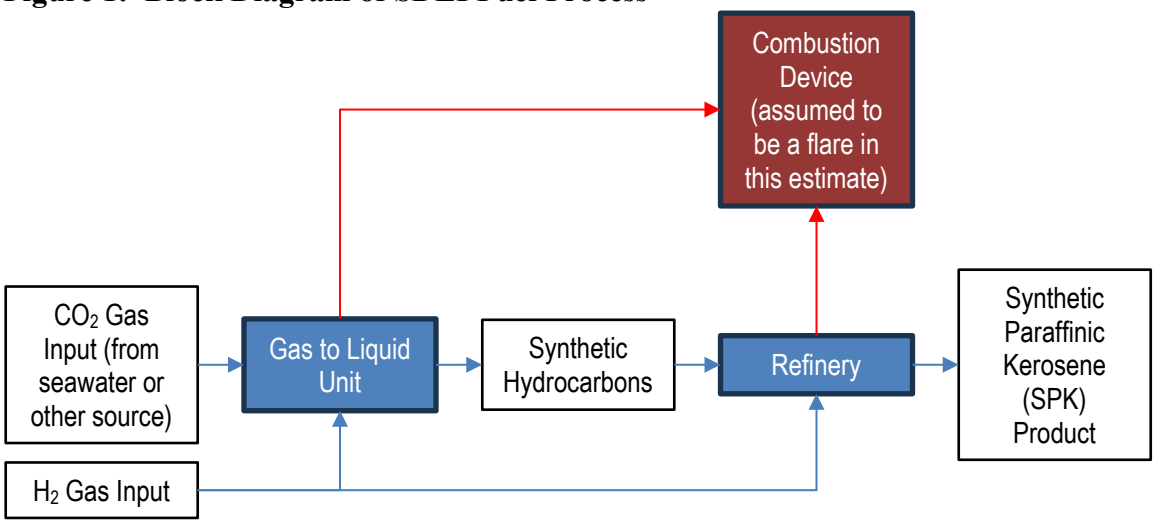
The section below provides an estimate of the air pollutants that the proposed project would generate annually. The estimate is well below the limits listed in HAR 11-60.1-62(d)(1). Furthermore, the proposed project does not involve any equipment or process that would burn off-spec fuel or employ a storage tank, reservoir, or other container with a capacity exceeding 40,000 gallons.

Estimation of Air Pollutants

SDEI Process Description and Capacity

The part of the SDEI process that generates air pollutants is summarized in Figure 1. A description of the entire SDEI process is enclosed.

Figure 1: Block Diagram of SDEI Fuel Process



The carbon source for the process is entirely CO_2 gas, either obtained from seawater or obtained from a commercial source. The only combustion devise and the only device generating air

pollutants is assumed to be a self-ignition flare. As mentioned above, other combustion devices are being considered, but the type of device will not have a substantial role in the amount of air pollutants generated by the proposed project. The proposed R&D unit is anticipated to generate roughly 54 gallons of SPK per month.

Emissions Estimate – Anticipated Capacity/Level of Use

It is estimated that 60 gallons of synthetic hydrocarbons will be sent to the refinery per month, or 720 gallons per year. The R&D target is for 90 percent of the synthetic hydrocarbons sent to the refinery to be captured as SPK product. Therefore, 10 percent, or the equivalent of 72 gallons of synthetic hydrocarbon gases will be sent to the combustion device per year. The average molecular weight of the synthetic hydrocarbons closely resembles Dodecane ($C_{12}H_{26}$), which has a density of 6.25 pounds per gallon. Therefore, 450 pounds, or 0.225 tons, of hydrocarbon gas will be sent to the combustion device per year.

Hazardous Air Pollutant (Total Hydrocarbons)

The emission of total hydrocarbons is estimated to provide an upper limit for the emission of hazardous air pollutants. For this calculation we use a flare efficiency of 98 percent. Total hydrocarbon emissions = 450 pounds of vaporous hydrocarbons * 0.02% = 9 pounds per year of total hydrocarbons, which is well below the limit of 500 pounds per year for each hazardous air pollutant.

Lead

Lead is not anticipated to be generated by the proposed R&D system. There is no lead input to the system.

Sulfur Oxides (SOx)

SOx air pollutants are not anticipated to be produced by the proposed R&D project process. Unlike typical petroleum refining operations, the proposed project's feed stock does not include sulfur.

Carbon Monoxide (CO)

CO is produced when there is incomplete combustion of a fuel. A flare device is designed to burn a fuel and produce Carbon Dioxide (CO_2) and water (H_2O). The assumptions used to calculate CO emissions from the R&D project include:

- Flare efficiency of 98 percent.
- The process of producing CO in this case would be Dodecane, $C_{12}H_{26}$, + 12.5 O_2 → 12 CO + 13 H_2O. This assumes that all the fuel carbon becomes CO, which is a very conservative assumption, so that 1 mole of Dodecane produces 12 moles of CO.
- The molecular weight of Dodecane is 170 grams/mole and the molecular weight of CO is 28 grams/mole.

We estimate that 450 pounds of vaporous hydrocarbons (i.e., Dodecane) is sent to the flare each year and that 2 percent, or 9 pounds of Dodecane is potentially incompletely combusted and produces CO. From that we calculate as follows: 9 pounds * 454 grams/pound * 1 mole/170 grams = 24 moles of Dodecane per year * 12 moles CO/1 mole of Dodecane = 288 moles of CO * 28 g/mole = 8,064 grams of CO * 1 ton/907,158 grams = 0.0089 ton of CO emissions. This is well below the limit of 5 tons per year.

Nitrogen Oxides (NOx)

NOx are created when nitrogen and oxygen react during the burning of fuel in air. The R&D processes emissions of NOx are estimated using the Environmental Protection Agency (EPA) information in the Environmental Protection Agency's (EPA) AP-42 Air Emissions Factors and Quantification guidance; specifically, Chapter 5 Petroleum Industry (https://www.epa.gov/sites/default/files/2020-09/documents/5.1_petroleum_refining.pdf). That EPA guidance states that NOx generation from a flare is estimated at 0.054 kilograms/1,000 liters (264 gallons) of refinery feed. With 720 gallons of feed per year, less than 0.2 kilogram (<0.0002 ton) of NOx would be emitted. This is well below the limit of 2 tons per year.

Emissions Estimate – Using EPA Guidance Exclusively

As an alternative to the above emission estimates, this section relies exclusively on the EPA AP-42 Air Emissions Factors and Quantification guidance for flares in a petroleum industry setting. Table 1 summarizes the calculations using an annual feed of 720 gallons, which is roughly 2,726 liters. This emissions estimate does not include lead because there is no lead input to the SDEI system.

Table 1: Emissions Estimate Using EPA AP-42 Guidance

Air Pollutant	EPA AP-42 Emission Rate	SDEI Annual Feed	SDEI Annual Emission	SDEI Annual Emission	HAR 11-60.1-62(d) Exemption Annual Emissions Limit
Units:	Kg/1000L	1000L	Kg	Ton	Ton
SOx	0.077	2.726	0.21	0.00023	2.0
CO	0.012	2.726	0.033	3.61E-05	5.0
Hydrocarbons	0.002	2.726	0.0055	6.01E-06	0.25
NOx	0.054	2.726	0.15	0.00016	2.0

Table 1 shows that the proposed project emissions are well below the exemption limits in HAR 11-60.1-62(d). In fact, it is estimated that the SDEI annual feed would need to increase by nearly 4 orders of magnitude to exceed any of the exemption limits.

Conclusion Regarding need for a Noncovered Source Permit

Based on the emission estimates outlined above, PSI has concluded that the proposed SDEI R&D project does not require a noncovered source permit or any other permit associated with air quality.

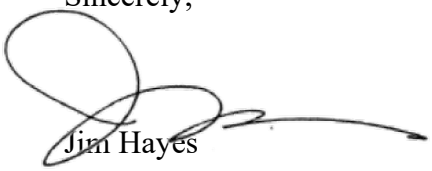
Request for Input

We invite you to provide input regarding SDEI's proposed R&D project. Specifically, we request that your office concur with our conclusion that no permit or approval associated with air quality or air pollutant emissions is required for the project. Please submit your input by August 9, 2024, to:

Jim Hayes
Planning Solutions, Inc.
711 Kapi'olani Boulevard, Suite 950
Honolulu, HI 96813
jim@psi-hi.com
808-550-4559

Thank you for participating in the planning process for this proposal.

Sincerely,



Jim Hayes

Enclosure: SDEI Process Description

From: Song, Chenyan <Chenyan.Song@doh.hawaii.gov>
Sent: Thursday, July 18, 2024 11:09 AM
To: Jim Hayes <jim@psi-hi.com>
Cc: Julia Ham Tashima <julia@psi-hi.com>
Subject: RE: Pre-Assessment Consultation for Seawater-to-Jet Fuel Research & Development Project

Hi Jim and Julia,

We received your letter dated July 10, 2024 via email, requesting for determination on the applicability of an air permit. As I understand, the proposed enclosed flare will be the only stationary emission source for regulated air pollutants. According to your calculations, the regulated air pollutant emissions will be well below the thresholds to trigger an air permit defined in HAR 11-60.1-62(d). To process your request, we need the following additional information/clarification:

1. You mentioned "other combustion devices are being considered, but the type of device will not have a substantial role in the amount of air pollutants generated by the proposed project" in your letter. Can you list what the other devices are and why you think they will generate less emissions than the proposed flare?
2. Your emissions calculations are based on the estimated production of 720 gal/yr synthetic CHs. You also mentioned that the R&D unit would not operate continuously. Just want to let you know that the thresholds defined in HAR 11-60.1-62(d) are based on 8,760 hr/yr of continuous operation. Would you please clarify if 720 gal/yr is based on continuous operation? If not, would you please re-calculate the emissions based on the maximum production by assuming the unit will operate continuously?

Thanks,

Chenyan Song, P.E. | *she/her*
Environmental Engineer | Environmental Management Division | Clean Air Branch
Hawai'i State Department of Health | Ka 'Oihana Olakino
Hale Ola | 2827 Waimano Home Road, Room 130 | Pearl City, HI 96782
Office: (808) 586-4200 | Fax: (808) 586-5359
https://health.hawaii.gov/cab/

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From: Jim Hayes
Sent: Thursday, July 18, 2024 11:24 AM
To: Song, Chenyan <Chenyan.Song@doh.hawaii.gov>
Cc: Julia Ham Tashima <julia@psi-hi.com>
Subject: RE: Pre-Assessment Consultation for Seawater-to-Jet Fuel Research & Development Project

Song,
Thanks for your response. To answer your questions as best I can at the moment, I offer the following:

1. The only other combustion device being considered currently is a catalytic oxidizer similar to the attached. The flare is considered the more likely choice at the moment. Do you agree that the unit employed doesn't have a substantial effect on emissions?
2. The 720 gal/yr is the estimate for actual operation, which is not continuous operation. We will need to do some thinking about how to generate an emissions estimate for continuous operation.

Thanks for any advise you can provide. Let us know if you have any other questions.
Have a good day,

Jim Hayes
Planning Solutions, Inc.
O: 550-4559; C: 354-4553

From: Jim Hayes <jim@psi-hi.com>
Sent: Monday, July 22, 2024 10:30 AM
To: Song, Chenyan <Chenyan.Song@doh.hawaii.gov>
Cc: Julia Ham Tashima <julia@psi-hi.com>
Subject: [EXTERNAL] RE: Pre-Assessment Consultation for Seawater-to-Jet Fuel Research & Development Project

Song,
Following up on item #2 below. The designers and owners of the R&D project confirm that it won't be possible to operate continuously (24/7/365). In a pretend world where they were able to operate continuously, 20 gallons of feed stock would go the refinery per 24 hours period, or 7,300 gallons per year. This is an order of magnitude increase over the expected operation. Table 1 from our letter would look like this:

Air Pollutant	EPA AP-42 Emission Rate	SDEI Annual Feed	SDEI Annual Emission	SDEI Annual Emission	HAR 11-60.1-62(d) Exemption Annual Emissions Limit
Units:	*Kg/1000L*	*1000L*	*Kg*	*Ton*	*Ton*
SOx	0.077	27.63	2.13	0.0023	2.0
CO	0.012	27.63	0.33	3.61E-04	5.0
Hydrocarbons	0.002	27.63	0.055	6.01E-05	0.25
NOx	0.054	27.63	1.5	0.0016	2.0

The proposed project emissions would continue to be well below the exemption limits in HAR 11-60.1-62(d). In fact, the annual feed would need to increase by nearly another 3 orders of magnitude to exceed any of the exemption limits.
Please let us know if you have any other questions or needs. We look forward to your official assessment of the need for an air quality permit for this proposed project.
Have a good day,

Jim Hayes
Planning Solutions, Inc.
O: 550-4559; C: 354-4553

From: Song, Chenyan <Chenyan.Song@doh.hawaii.gov>
Sent: Tuesday, July 23, 2024 10:59 AM
To: Jim Hayes <jim@psi-hi.com>
Cc: Julia Ham Tashima <julia@psi-hi.com>
Subject: RE: Pre-Assessment Consultation for Seawater-to-Jet Fuel Research & Development Project

Hi Jim,

Thank you for the updated calculations. One more question, how SDEI will store the synthetic hydrocarbons and final product? If they plan to use a tank, may I know the size of the tank?

Thanks,

Chenyan Song, P.E. | *she/her*
Environmental Engineer | Environmental Management Division | Clean Air Branch
Hawai'i State Department of Health | Ka 'Oihana Olakino
Hale Ola | 2827 Waimano Home Road, Room 130 | Pearl City, HI 96782
Office: (808) 586-4200 | Fax: (808) 586-5359
https://health.hawaii.gov/cab/

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From: Jim Hayes
Sent: Tuesday, July 23, 2024 12:12 PM
To: Song, Chenyan <Chenyan.Song@doh.hawaii.gov>
Cc: Julia Ham Tashima <julia@psi-hi.com>
Subject: RE: Pre-Assessment Consultation for Seawater-to-Jet Fuel Research & Development Project

Song,
The synthetic hydrocarbons/product would be stored in 55-gallon drums (or similarly sized appropriate containers) and no more than 220 gallons would be allowed to accumulate. The drums/containers would be within an appropriate spill containment system.
So, not a "tank." There would be no bulk storage of fuel.
Hope that helps.

Jim Hayes
Planning Solutions, Inc.
O: 550-4559; C: 354-4553

JOSH GREEN, M.D.
GOVERNOR OF HAWAI'I
KE KIA'ĀINA O KA MOKU'ĀINA 'O HAWAI'I

KENNETH S. FINK, MD, MGA, MPH
DIRECTOR OF HEALTH
KA LUNA HO'OKELE

STATE OF HAWAII
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File:
24-342E CAB

August 12, 2024

Mr. Jim Hayes
Planning Solutions, Inc.
711 Kapiolani Boulevard, Suite 950
Honolulu, Hawaii 96813

Dear Mr. Hayes:

SUBJECT: Air Permit Applicability Determination
Seawater-to-Jet Fuel Research & Development Project (SJF R&D)
Sea Dragon Energy, Inc. (SDEI)
Located At: Destiny Site, Hawaii Ocean Science and Technology (HOST) Park, Kailua-Kona, Island of Hawaii
Tax Map Key: 7-3-043:081

The Department of Health, Clean Air Branch (CAB), acknowledges receipt of your letter via email on July 10, 2024, and additional information via emails on July 18, 2024, July 22, 2024, and July 23, 2024, on behalf of SDEI, requesting a determination of permit applicability for the subject SJF R&D project.

According to the letter:

- SDEI plans to construct and operate a SJF demonstration unit at the subject location to produce synthetic paraffinic kerosene (SPK) as the final product.
- Following refining, the majority of the crude product (synthetic hydrocarbons) will turn into SPK and the rest will be treated in a combustion device. The proposed combustion device, a self-ignition flare or electric catalytic oxidizer, will be the only stationary emission source to generate regulated air pollutants in the project.
- The synthetic hydrocarbons and SPK will be stored in 55-gallon drums or similarly sized appropriate containers within an appropriate spill containment system and no more than 220 gallons will be accumulated on site.

The CAB concurs that the proposed combustion device is exempt from air permitting requirements. This determination is based on the information provided with the letter and emails, and the following reasons:

1. The maximum annual SPK produced, 7,300 gallons, is estimated based on an assumption where the SJF demonstration unit operates continuously.

2. Ten percent (10%) of the synthetic hydrocarbons will be treated in the proposed combustion device: a self-ignition flare or an electric catalytic oxidizer.

3. The estimated maximum potential to emit for each regulated air pollutant is less than the amount that would trigger an air permit as defined in Hawaii Administrative Rules (HAR), Section 11-60.1-62(d). Hence, the proposed combustion device qualifies for the exemption under HAR, Section 11-60.1-62(d).

This determination does not release the owner or operator from compliance with all applicable provisions of HAR, Chapter 11-60.1. The determination is made on a case-by-case basis and any changes in equipment, emissions, or location will require a separate determination.

If there are any questions regarding this matter, please contact Ms. Chenyan Song of my staff at (808) 586-4200.

Sincerely,

MARIANNE ROSSIO, P.E.
Manager, Clean Air Branch

CS:tkg

To: The Board of Directors, Natural Energy Laboratory of Hawaii Authority (NELHA)

Subject: Testimony Regarding Proposed Lease to Sea Dragon Energy Inc.

Dear Members of the Board,

I am submitting testimony as a business owner in the park, voicing my concern regarding the proposed space leasing to Sea Dragon Energy Inc, a subsidiary of GALT Aerospace. This company intends to develop seawater-to-jet fuel technology, a project financially backed by the US Navy and conducted under a private entity, primarily for use in warships. My decision to formally address this issue stems from concerns raised by members of the Kona community, who reached out to me directly after reviewing the community pre-assessment consultation distributed by Sea Dragon Energy Inc (attached).

I acknowledge the importance of innovative research and development in our park facilities. However, we believe this project does not align with NELHA's stated mission, goals, or desired direction. My concerns are as follows:

1. **Misalignment with NELHA's Mission Statement:** As Board Member Neil Sims from Ocean Era noted during the pre-proposal process, the project does not reflect NELHA's commitment to sustainable and culturally sensitive development. Sea Dragon Energy Inc is a subsidiary of GALT Aerospace, whose website byline states that they are "focused on developing and delivering warfighter centric solutions". The primary purpose of this technology is to enable warships to produce fuel for fighter jets without docking, a far cry from the renewable and civilian-focused initiatives we aspire to support.

2. **Non-Disclosure of Actual Intent:** Sea Dragon Energy Inc, despite its claims of developing renewable technology in the community pre-assessment consultation (attached), has no intention of making this technology available to the general public. This starkly deviates from their initial proposal to the NELHA BOD, raising concerns about transparency and trustworthiness.

3. **Excessive Freshwater Usage:** NELHA's freshwater reserves are already at their limit. Community organizers are becoming increasingly aware of NELHA's freshwater usage as it is starting to hinder affordable housing development in our community. Allocating precious water resources to a project that supports the development of military technology, rather than community welfare and self-sufficiency, is a misuse of these vital assets.

4. **Impact on Hawai'i's Socio-Environmental Fabric:** Hawai'i has endured significant challenges due to the activities of the US Department of Defense, ranging from sex trafficking and bombing exercises to water pollution. While we maintain deep respect for our veterans, further military presence, especially in a research park devoted to sustainability and community development, contradicts upward momentum on

demilitarization and environmental protection. If Sea Dragon Energy Inc causes unanticipated harm to the environment or community, which is not unlikely given their affiliation with the Department of Defense (Red Hill, Kahoʻolawe, Pōhakuloa), the damage will be irreversible to NELHA's reputation, the livelihood of businesses in the park, workforce mental health, and beyond.

5. **Adverse Effects on NELHA Community and STEM Opportunities:** The presence of a US Navy project focused on weaponry could potentially undermine our efforts to promote culturally aware STEM opportunities and attract a diverse workforce. It risks eroding the trust we have built with our community and other partners across Hawai'i. We are already receiving questions from community members regarding the proposal, and we do not wish to justify the presence of the US Department of Defense developing weaponry at NELHA. <u>There is no justification.</u>

6. **Proximity to Educational Institutions:** The proposed location of the US Naval technology facility, in close proximity to WHEA High School, raises concerns about safety, security, and the kind of environment we are creating for our future generations.

In light of these points, I urge the Board to reconsider the proposed lease to Sea Dragon Energy Inc. Our priority should be to uphold NELHA's potential to foster sustainable and community-oriented development while preserving Hawaii's natural resources and social fabric.

Thank you for considering our perspective in this important decision.

Sincerely,

Alexia Akbay
CEO, Symbrosia Inc

Jim Hayes

From: Amanda Pavese <amanda@symbrosia.co>
Sent: Sunday, January 28, 2024 11:55 AM
To: Jim Hayes
Subject: Sea Dragon Energy Inc lease

Aloha Jim,

I'm the cultivation manager at Symbrosia and was just informed of the proposed lease from Sea Dragon Energy Inc. After researching the technology they are developing, it's clear to me that this project does not fit with the goals of the NELHA facility and I do not think they should be granted lease approval. Below are a few points on why this company should be denied permitting.
1) This area should be focused on aquaculture and supporting the local community, not another area for military contracted research.
2) The history of the US military utilizing land in Hawaii to the detriment of the local community is long and ongoing. We do not need another weapons facility destroying the land and utilizing resources that should be directed to small businesses working at Nelha.
3) This high security facility would be directly across from WHEA high school. We should not have a facility like this so close to our keiki.
4) The technology behind this research is problematic. The process utilizes a vast amount of both fresh and saltwater, and after a brief look into the methodology, would have enormous impacts on our local ecology. In addition to using heavy metal catalysts, it would consume massive amounts of water that would harm ocean life. The process also produces a substantial amount of methane, and between that and the fact that the product would be used as jet fuel which would release carbon back into the environment, any claimed renewable energy benefit is simply lip service. https://www.smithsonianmag.com/innovation/fuel-seawater-whats-catch-180953623/

For these reasons and many others I do not think they should be granted a lease. The facility and land they want to use would be better off in the hands of another small company or a facility that would contribute to supplying the local community with a sustainable food source.

Thank you for your time.

Amanda

--
Amanda Pavese
Cultivation Manager
73-4460 Queen Ka'ahumanu Hwy Suite 111
Kailua-Kona, HI 96740

Jim Hayes

From: Charlotte Taylor <charlotte@symbrosia.co>
Sent: Monday, January 29, 2024 2:01 PM
To: Jim Hayes
Subject: Feedback on Sea Dragon Energy in NELHA

Good Afternoon,
My name is Lois Taylor and I work at Symbrosia in the NELHA park. I was very disappointed upon hearing of Sea Dragon Energy attempting to lease space in NELHA. NELHA was started with the intention to promote local aquaculture and provide STEM based opportunities to the Hawaiian community. Allowing a Military company into NELHA would not comply with these intentions. Furthermore, the technology that this company seeks to create would not be shared with the public nor would it be helpful to NELHA or the local community in any way. Given the military's blatant disregard for safety and quality control as displayed in Oahu with the Red Hill incident, it would be foolish to allow them a lease in NELHA. There is already a large enough military presence in Hawaii, myself and others in the community would not like to see it spread further.
Thank you for your time and I hope this feedback is helpful.

--
Lois Charlotte Taylor
Symbrosia Algae Cultivation
(808) 747-5118

Jim Hayes

From: Haeleigh Grajo <haeleigh@symbrosia.co>
Sent: Tuesday, January 23, 2024 7:14 AM
To: Jim Hayes
Subject: AGAINST SEA DRAGON ENERGY INC at NELHA

Jim,

My name is Haeleigh Grajo and I work at NELHA park. I am against the Sea Dragon Energy Inc's US naval project regarding deep sea water conversion to jet fuel. Military occupancy in Hawai'i has been an ongoing issue, and has affected Hawaiians by stripping resources, taking advantage of the locals, and desecrating the land. The military uses Hawai'i for her resources and does not give back to her or her people.

In addition, this project is not aligned with any company's mission at NELHA, to share information on how to be sustainable… as this project intends to pocket the information. We do not promote research whose means are weaponization.

The military has used enough of Hawaiis resources, and does not need to be using more.

I am AGAINST the Sea Dragon Energy Inc's US NAVY project to convert deep sea water to fuel.

Jim Hayes

From: Bryant De Groot <bryantdegroot@yahoo.com>
Sent: Saturday, January 27, 2024 1:07 PM
To: Jim Hayes
Subject: Sea dragon energy inc.

My name is Bryant and I am a part of the Kanaka diaspora. My grandmother and those before her were born and raised in Hawai'i but due to the ongoing occupation and colonization from both the US government and military, and foreign citizens/permanent tourists; my family was forced to start their life over in CA. I am explicitly against the U.S. navy's continued and expanding waste and hoarding of limited precious resources that destroy our sacred homeland and spell violence against our people and communities. Too much land and fresh water has been siphoned from the people into the hands of private investors such as Sea dragon energy inc and this new research proposal only seeks to further that extortion. Stop the senseless draining of Hawai'is water and land while there's still time to save what's left. You can't put a price on life and no amount will bring back our sacred 'Āina from this continued destruction.

Jim Hayes

From: Stephen Holmes <councilmemberholmes@icloud.com>
Sent: Monday, January 22, 2024 7:08 PM
To: Jim Hayes
Cc: Cindi Punihaole; Cory (Martha) Harden; Robert Culbertson; Chuck Flaherty; Hannah Hartmann; Jon Olson
Subject: Seawater return trenches at NELHA

Jim:
These proposed discharges would require an NPDES permit as required under the Clean Water Act. A decision by the U.S. Supreme in Maui County v. Hawaii Wildlife Fund makes this requirement clear. Hawaii County was recently taken to federal district court over discharges to groundwater that then convey pollutants to regulated waters of the United. States. Earthjustice won the case before the Supreme Court and U.S. now representing Hui Malama Honokohau in this follow on litigation.

This is a statewide issue, but one made worse by HDOH failing to take proper regulatory action leaving discharges open to Citizen Suits. EPA Region 9 Enforcement is aware of the NELHA “seawater return trenches” as it was previously brought to their attention.
It comes down to hydrology and these trenches are all well within the test established by the high court as they are quite close and the under geology is quite porous. Transport of pollutants would be very fast.

Also, Hawaii has established a decarbonization law and making fuel of this sort has to look at all the GHG emissions under a separate state law. This would include sources like Hawaiian Electric’s power generation, energy needed for deep seawater pumping, and energy for hydrogen production.

Steve Holmes
Kailua-Kona, Hawaii
Former U.S. Department of Energy National Energy Champion

Appendix B. USFWS IPaC Report

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Hawaii County, Hawaii

Local office

Pacific Islands Fish And Wildlife Office

(808) 792-9400
(808) 792-9580

MAILING ADDRESS
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000

PHYSICAL ADDRESS
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850-0056

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Hawaiian Hoary Bat Lasiurus cinereus semotus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/770	Endangered

Birds

NAME	STATUS
Band-rumped Storm-petrel Hydrobates castro No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1226	Endangered
Hawaiian Coot (alae keʻokeʻo) Fulica alai Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7233	Endangered
Hawaiian Duck Anas wyvilliana Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7712	Endangered
Hawaiian Goose Branta (=Nesochen) sandvicensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1627	Threatened
Hawaiian Petrel Pterodroma sandwichensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6746	Endangered

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Hawaiian Stilt Himantopus mexicanus knudseni — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2082

Newell''s Shearwater Puffinus newelli — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2048

Reptiles

NAME	STATUS
Hawksbill Sea Turtle Eretmochelys imbricata	Endangered

Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/3656

Insects

NAME	STATUS
Blackburn's Sphinx Moth Manduca blackburni	Endangered

Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/4528

Flowering Plants

NAME	STATUS
Ihi Portulaca villosa	Endangered

Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/4886

Ko`oko`olau Bidens micrantha ssp. ctenophylla — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/1585

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Ohai Sesbania tomentosa — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/8453

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your

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project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
'apapane Himatione sanguinea This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands.	Breeds Dec 1 to Jul 31
Black Noddy Anous minutus melanogenys This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands.	Breeds Apr 1 to Nov 30
Hawai'i 'amakihi Chlorodrepanis virens This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands.	Breeds Nov 15 to Aug 15
Wandering Tattler Tringa incana This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands.	Breeds elsewhere

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

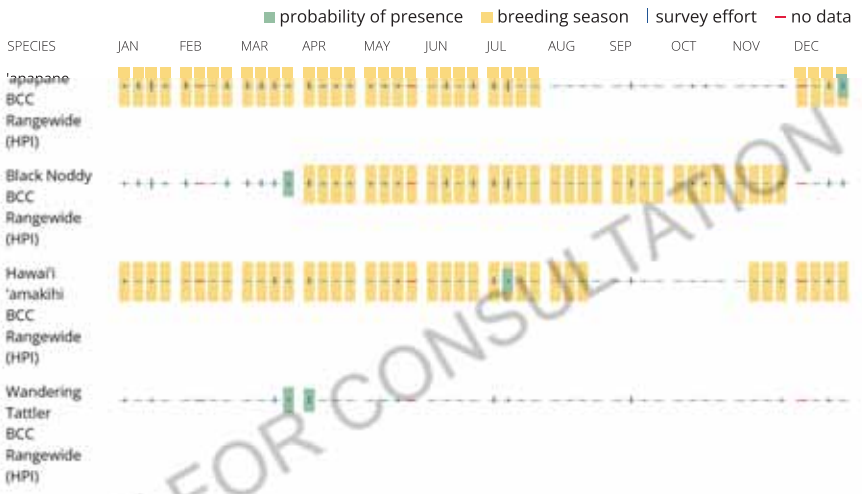
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science

datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the

individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

NOT FOR CONSULTATION

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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