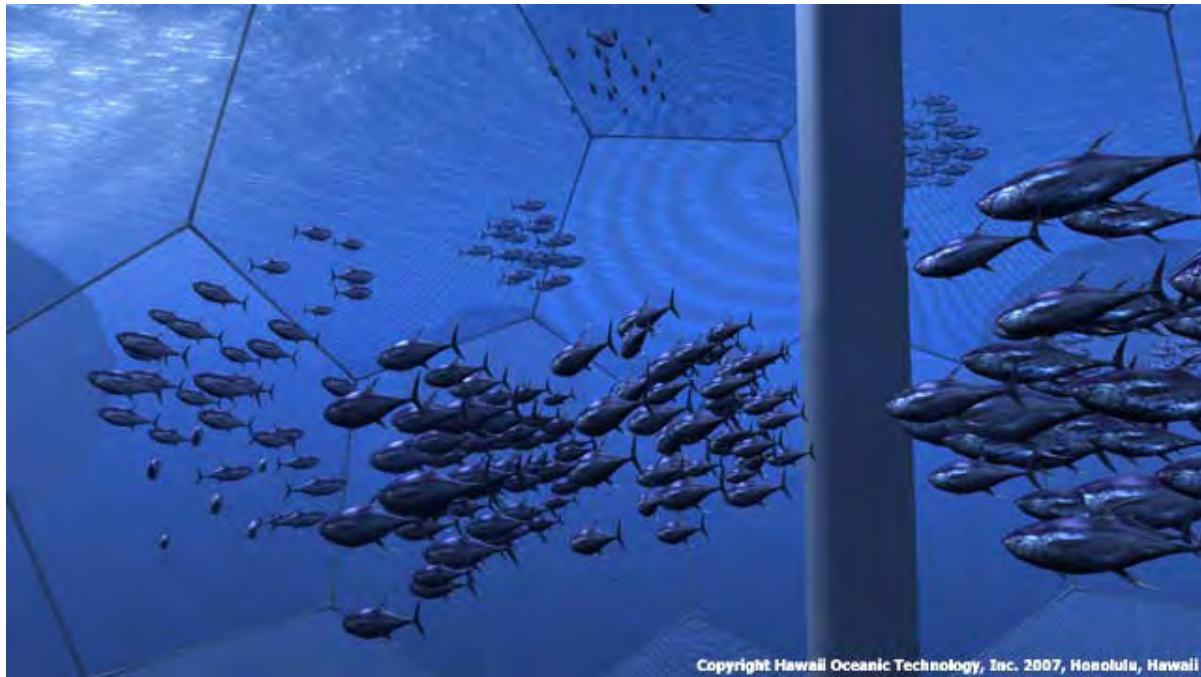


Hawaii Oceanic Technology Ahi Aquaculture Project

Environmental Impact Statement Preparation Notice / Environmental Assessment



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This Environmental Document is Prepared Pursuant to Hawai'i Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Hawai'i Administrative Rules, Department of Health, Environmental Impact Statement Rules.

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November 2008

Hawaii Oceanic Technology Ahi Aquaculture Project
Environmental Impact Statement Preparation Notice / Environmental Assessment

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1. Introduction

1.1 Overview

This environmental impact statement preparation notice (EISPN) has been prepared for Hawaii Oceanic Technology's proposal to raise yellowfin tuna (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) segregated by species, in submerged self-powered un-tethered cages called "Oceanspheres" in a 247-acre open ocean lease site, 1,320-feet deep, 2.6 nautical miles (4.2 kilometers) offshore Malae Point, North Kohala. Twelve Oceanspheres will be deployed incrementally over four years, using careful observation and monitoring to ensure compliance with environmental standards, culminating with a production capacity of 6,000 tons of ahi per year. Fingerlings will be grown out from eggs collected from broodstock caught in coastal waters off the Island of Hawaii and will be supplied in collaboration with the Pacific Aquaculture & Coastal Resources Center (PACRC). Each Oceansphere will be fitted with an automated feed dispenser. The tuna will be hatched at PACRC and grown to Oceansphere transferable size in land-based tanks. The tuna will be transferred by a vessel to the open ocean Oceanspheres when they are approximately 12 inches in length and 5 pounds in weight, and will be grown to approximately one hundred pounds in size. The tuna will be harvested at sea for transshipping through Hilo Harbor and Kawaihae Harbor, to processing and packaging vendors for shipping by air to the US mainland, Japan, and Hawaii markets.

Hawaii Oceanic Technology proposes to produce a high-quality, high-grade sustainable source of protein in an environmentally sensitive manner. A high tech aquaculture system will be developed that produces a superior product by raising fish from hatchling to ready-to-market product under controlled conditions of feeding and harvesting. Project design will allow for maintaining water quality, with high dilution of effluent through natural circulation in deep ocean waters, use of organic feeds, recycling of metabolic products, and use of renewable/thermal energy for power needs.

The EIS will be developed in accordance with Hawai'i's environmental impact statement law (Hawai'i Revised Statutes [HRS] 343). The purpose of the EIS is to inform decision makers and the public of the likely environmental consequences of the proposed action. It focuses on site-specific issues of the project and the impacts on the Island of Hawai'i.

Project Name: Ahi Aquaculture Project

Location: 247 acres of State Marine Waters off of the North Kohala Coast, approximately three miles (2.6 nautical miles) due southwest of Malae Point. The centerpoint is located at 20°05'40.00" N 155°55'40.00" W. The four corners are located at 20°05'53.72" N 155°55'55.68" W; 20°05'53.72" N 155°55'24.36" W; 20°05'26.04" N 155°55'24.36" W; and 20°05'26.04" N 155°55'55.68" W.

Judicial District: North Kohala

Applicant: Hawaii Oceanic Technology, Inc.
425 South Street, Suite 2902
Honolulu, Hawai'i 96813
Attn: Mr. Bill Spencer, Chief Executive Officer
Telephone: 808-225-3579
Fax: 808-528-4751
www.kingahi.com

Recorded Fee Owner: State of Hawai'i

Land (Ocean) Area: 247 acres (1.0 sq km) (Proposed Action)

Existing Use: Conservation
State Land Use: Conservation
Subzone: Resource
Marine Water Class: A
Marine Bottom Ecosystem: II

County General Plan: Ocean site has no LUPAG designation
County Zoning: Ocean site has no County zoning
Special Management Area: Ocean site is not in SMA

Accepting Authority: Department of Land and Natural Resources,
Office of Conservation and Coastal Lands
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawai'i 96813
Attn: Chairperson Laura Thielen
Telephone: 808-587-0377
Fax: 808-587-0390

EIS Preparer/ Agent: Tetra Tech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Tel: (808) 533-3366
Fax: (808) 533-3306
Attn: George Redpath

1.2 Project Site

1.2.1 Description and Location

The Hawaii Oceanic Technology Ahi Aquaculture Project proposes to operate from an ocean lease site based three miles (2.6 nautical miles) offshore Malae Point in North Kohala, and a commercial site leased at Kawaihae Commercial Harbor. The open ocean aquaculture operations and ocean site for the Oceanspheres will be off the North Kohala Coast approximately three miles (2.6 nautical miles) directly offshore (southwest) of Malae Point (Figure 1), located in waters with a depth of 1,320 feet (402.34 meters).

The harvested fish will be transported from the ocean site by boat directly to Hilo Harbor fish-packing facilities or Kawaihae Commercial Harbor for trans-shipment by truck to Kona Fish Company, or other fish processing operation in Kona, and on to Kona International Airport. Feed storage and feed transport to the feed boat will take place from Kawaihae Commercial Harbor. The land-based support for every day ocean operations will be in Kawaihae Commercial Harbor. The harbor has 23 boats moored in the deep-draft commercial area, two Tahiti-style moorings, a container loading area, a container lot, and a loading pier.

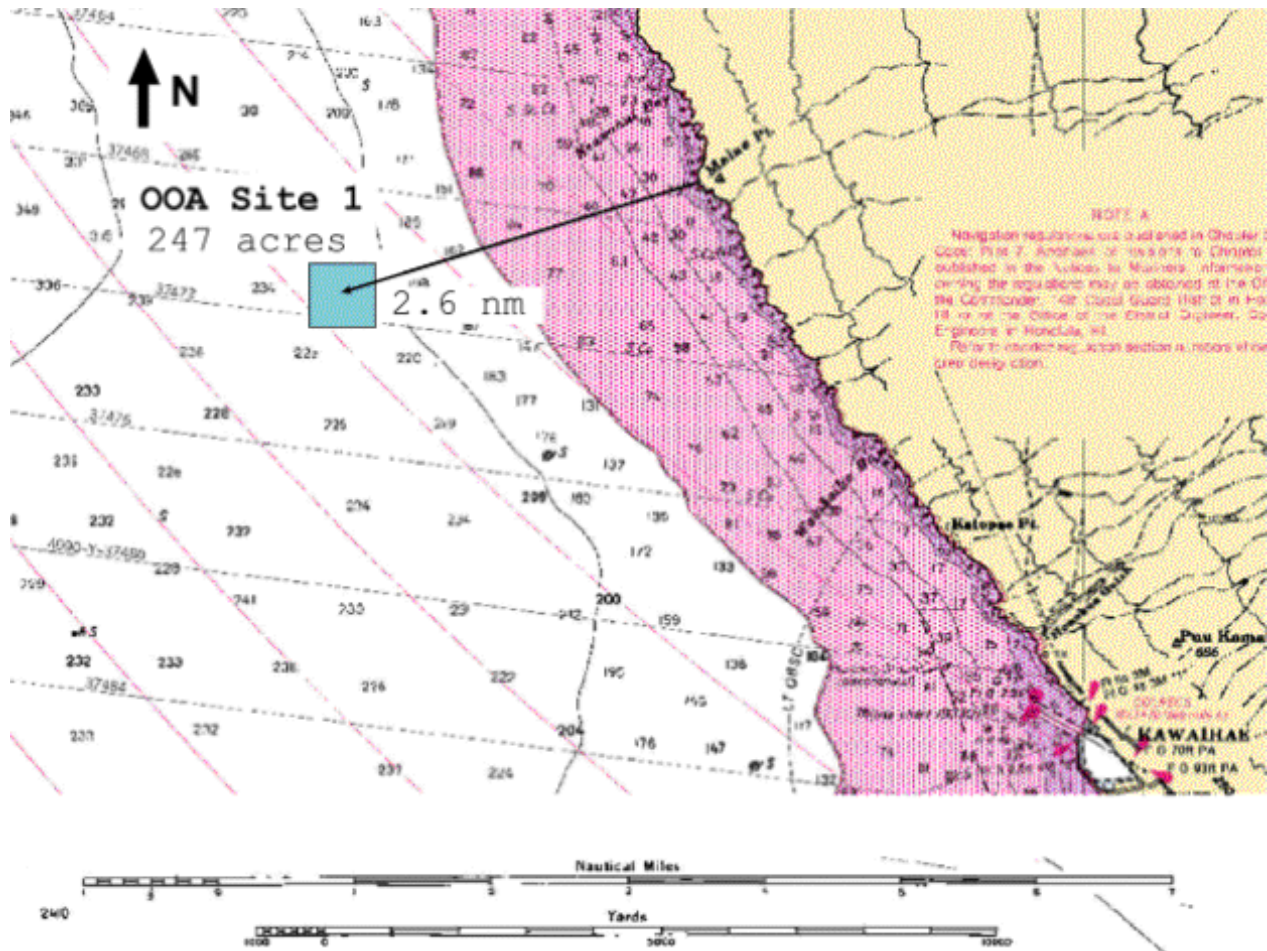
Hawaii Oceanic Technology will lease a commercial lot at Kawaihae Commercial Harbor. The site will include the following:

- An office;
- A large fenced-in area for storing tools and equipment;
- A small communications station;
- Self-Contained Underwater Breathing Apparatus (SCUBA) equipment storage;
- An air compressor for SCUBA tanks; and
- Fish feed storage.

Three trucks used for transportation and maintenance, and three 35-foot work boats equipped with two large outboard engines (i.e. 150 hp) each and trailers will be parked at the site. Additional boats will be contracted as needed from local fisherman and salvage companies (i.e. Chuck Wilson, Fire Hatt, Kailua Kona and Hawaiian Interisland Towing Inc, Pier 21, Honolulu HI 96813).

Figure 1. Proposed Action: Preferred Site 1 Malae Point.

Map of proposed Open Ocean Aquaculture Site (blue region) and the Humpback Whale Marine Sanctuary (purple region). The aquaculture site is 2.6 nautical miles due southwest of Malae Point. The center of the Ocean Lease Site is 20°05'40.00" N 155°55'40.00" W and the water depth is 1,320 feet (402.34 meters) (Map taken from NOAA HIHWNMS website).



The proposed location of the open ocean Oceanspheres is off the North Kohala Coast of the Island of Hawai'i. The Oceanspheres will be three miles offshore and will be outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS), shown in purple in Figure 1. The area proposed for leasing is 247 acres (1.0 square kilometers) and will contain 12 Oceanspheres, which will produce 6,000 tons of Ahi per year.

1.2.2 Surrounding Location and Uses

1.3 Project Objectives and Proposed Action

The State of Hawai‘i has the largest jurisdictional area of internal waters in the US and is one of the largest Exclusive Economic Zones (EEZ) in the world. It has 200,000 square miles of open ocean in its EEZ and is a known leader in aquaculture and ocean science technologies. United States Secretary of Commerce Carlos M. Gutierrez, on a December 2006 visit to aquaculture projects on the Island of Hawai‘i, declared it to be the “Silicon Valley of aquaculture” in the United States. The resources to develop the tuna farming system do exist and are available in these waters. The Kohala Coast of the Island of Hawai‘i is an excellent location for offshore aquaculture activities. It is a major agricultural region of the state, and the area is shielded from the prevailing North Pacific Equatorial Current and the Northwest tradewinds by Mauna Loa, Mauna Kea, and the Kohala Mountains and Hualalai. Open ocean oligotrophic waters are constantly being supplied by the prevailing currents from the south, and the waters become very deep close to shore, leading to ideal conditions for the mixing and recycling of waste.

The purpose of the proposed action is to meet the high demand for fish by providing a sustainable source of high quality, pure, clean tuna using Open Ocean Aquaculture (OOA). It has been reported that populations of large predatory fish in Hawaiian waters and the global ocean, including tuna, have been reduced to 90 percent of pre-industrial levels and that populations of exploited fish are predicted to vanish by 2048 (R. A. Myers and B. Worm 2003). Although these findings have been challenged (Hampton et al. 2005), world tuna catches are declining (FAO 2007), even in the face of increasing worldwide fishing efforts (Hilo Fisherman Robert Cabos *pers. comm.* 2007). The primary markets for Hawaii Oceanic Technology Ahi will be California and Japan, with a portion of the product being sold into the Hawai‘i market. Current demand for yellowfin and bigeye tuna in these three markets contributes to the fishing pressure on the natural stocks. Hawai‘i has a market of about 3,307 tons (3,000 metric tonnes) per year, where nearly 10.03 tons (9.1 metric tonnes) are consumed during the Christmas and New Year holidays. Through Open Ocean Aquaculture, Hawaii Oceanic Technology will provide a viable alternative source for yellowfin and bigeye tuna for local and export markets, as well as strengthen and diversify the Hawai‘i economy.

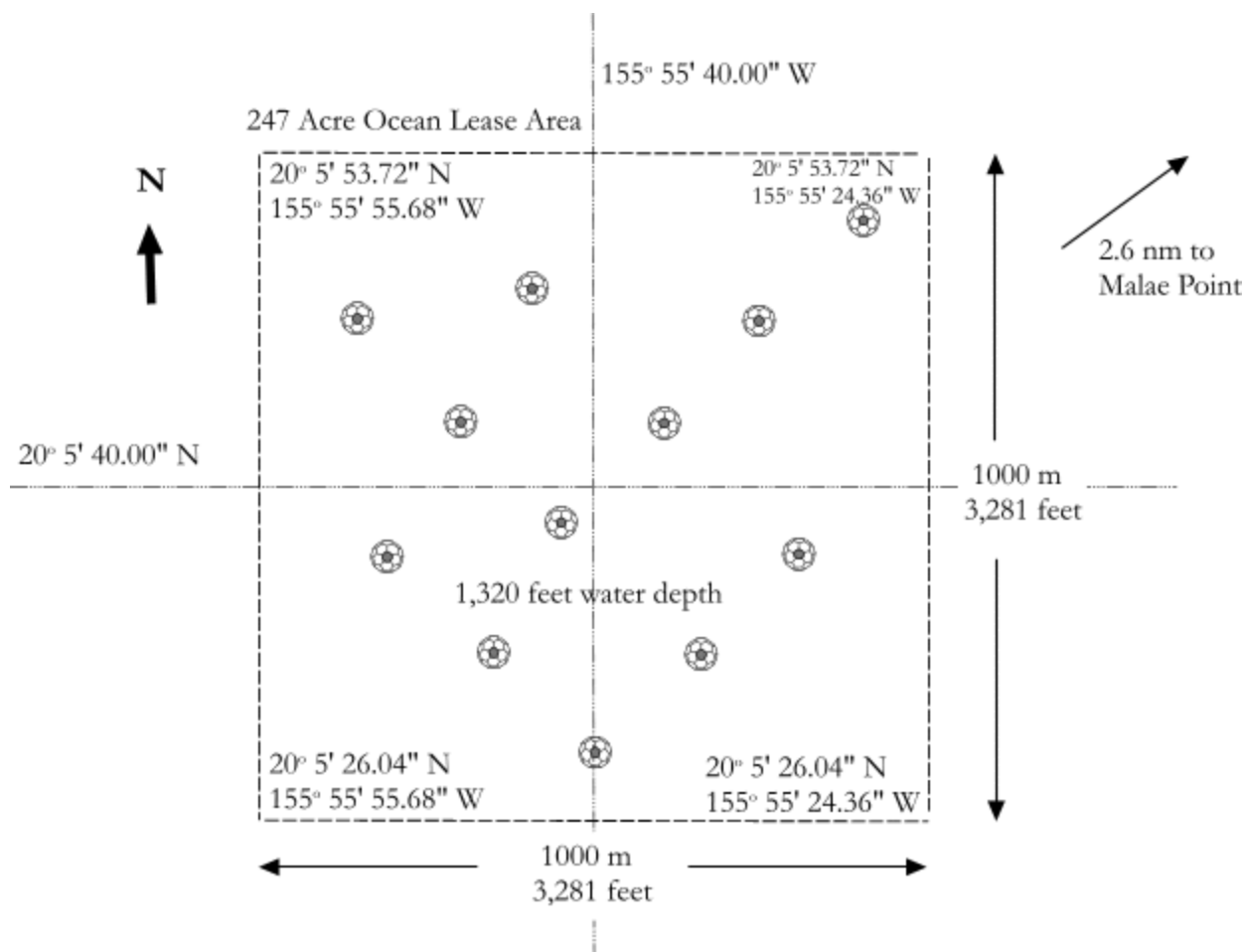
Hawaii Oceanic Technology intends to raise 6,000 tons (5,443 metric tonnes) per year of yellowfin tuna and bigeye tuna in an open ocean location 2.6 nautical miles (4.2 kilometers) offshore Malae Point, North Kohala, segregated by species in twelve submerged Oceanspheres when fully operational by 2012. Both of these species are referred to as Ahi by the local Hawai‘i community. Fingerlings will be grown out from eggs collected from broodstock caught in coastal waters off the Island of Hawaii and will be supplied in collaboration with the Pacific Aquaculture & Coastal Resources Center (PACRC). Each Oceansphere will be fitted with an automated feed dispenser. The tuna will be hatched at PACRC and grown to Oceansphere transferable size in land-based tanks. The tuna will be transferred by a vessel to the open ocean Oceanspheres when they are approximately 12 inches in length and 5 pounds in weight, and will be grown to approximately one hundred pounds in size. The tuna will be harvested at sea for

transshipping through Hilo Harbor and Kawaihae Harbor, to processing and packaging vendors for shipping by air to the US mainland, Japan, and Hawaii markets.

1.4 Proposed Project

The proposed action is planned as an incremental deployment of twelve Oceanspheres. One will be deployed in year one, two will be deployed in year two, four will be deployed in year three and five will be deployed in year four for a total of twelve Oceanspheres in operation by year five. Oceanspheres will be deployed using careful observation and monitoring to ensure compliance with environmental standards, especially water quality. Final deployment will culminate in all twelve Oceanspheres being evenly distributed in the lease site, as shown in Figure 2. The water depth at the site is 1,320 feet (402.34 meters); the top of the Oceanspheres will be held at a depth of 65 feet (20 meters) below the water surface.

Figure 2. Map of the Proposed Action at Preferred Site 1.



The proposed lease site is centered at 20°05' 40.00" N 155°55' 40.00" W, shown here with spacing of twelve Oceanspheres within the ocean lease site to maximize mixing.

Operations

Operations for the Hawaii Oceanic Technology Ahi Aquaculture Project include feeding, maintenance, and harvesting activities. Hawaii Oceanic Technology will provide at least 22 full-time equivalent jobs by year five, with an average salary of \$51,500.

Kawaihae Commercial Harbor, will house 22 employees which are; Site Manager, 3 Oceansphere operators, Operations Coordinator, 5 Seaman, 3 Biologist, 4 Divers and 5 Laborers. Additionally, Hawaii Oceanic Technology activities will provide the marine community with contracts for salvage, transportation, Oceansphere maintenance, and boat leasing. Hawaii Oceanic Technology will follow best management practices in the operation of this project.

Feeding

Ahi require two pounds of dry feed for every pound of wet weight that they grow; for example, 200 lbs (90.7 kilograms) of dry feed will be required to grow a 100-lb (45.4 kilograms) tuna. Dry feed will be purchased from a commercial supplier and shipped to Kawaihae Commercial Harbor. The source of the feed is determined by the supplier, and Hawaii Oceanic Technology will specify the content of the feed and quality standards. The feed will be inspected by the Hawai'i Department of Agriculture before being accepted. The EIS will include more details about the feed proposed to be used in the project. The feed will be provided to the fish in the Oceansphere through an automated feeding dispenser that is designed as an integral part of the Oceansphere. The EIS will include more details about this system. Additionally, Hawaii Oceanic Technology will contract with Hawai'i Institute of Marine Biology (HIMB) fish pathologists to inspect feed for the presence of disease pathogens. Ian Birnie Hawai'i District Manager for DOT Harbors Division, has been consulted on the project and space requirements at Kawaihae Commercial Harbor.

Tuna Health

SCUBA divers will be deployed almost daily to inspect the health of the tuna, and observe the feeding of tuna. Unmanned underwater robots will be used to remove mortalities. Estimated cumulative mortality is expected to be 1%. Oceanspheres being serviced will be raised to the surface before divers will begin their work. Maintenance will take place once a month and is expected to take approximately four hours. Once maintenance is completed, the Oceanspheres will be sent back to their original depth of 154 feet (47 meters), with the top at 65 feet depth (20 meters). Workers will visit the site every work day to maintain Oceanspheres and to supervise delivery of feed. SCUBA divers will be deployed while workers maintain the Oceanspheres.

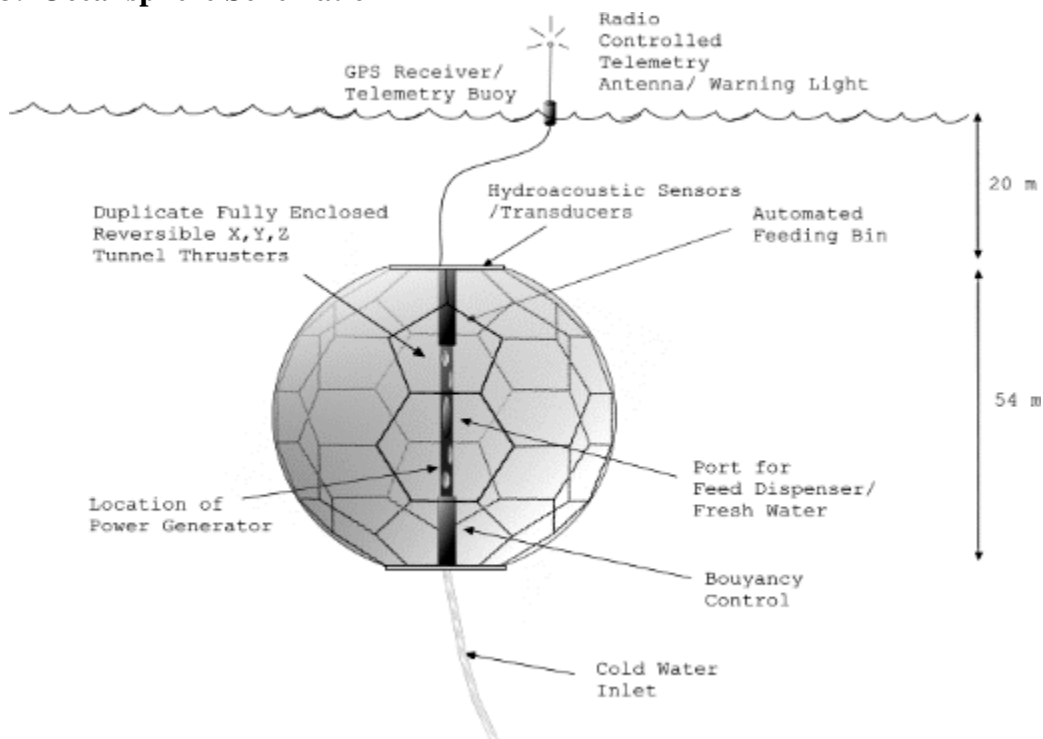
Ongoing fish health will be monitored through a contract with Hawai'i Institute of Marine Biology (HIMB) fish pathologists. Any fish mortalities retrieved from the Oceansphere will be sent to HIMB to determine the cause of death. HIMB biologists are not expected to visit the Oceanspheres. HOT is committed to producing organic grade tuna. The EIS will discuss any use

of antibiotics in its cultivation practices. To maintain optimal health, the Oceansphere allows for a generous stocking density and access to plenty of clean pathogen free seawater. The tuna will be fed a well balanced and vitamin enriched diet. However, if disease does show up, the fish will be treated under the guidance of Hawaii Institute of Marine Biology pathologist. The EIS will include more details about how the proposed project plans to manage disease issues and mortalities.

Oceansphere Description

Figure 3 is a schematic diagram of the Oceansphere. The Oceanspheres will be self-contained spheres and will not have any sharp surfaces or dangling lines to entangle wildlife or interfere with navigation or fishing. Each cage volume is 82,406 cubic meters, stocking density is 1 fish per 4 cubic meters and the single cage production is estimated at 1,000 tons of Ahi per year. The Oceanspheres will be composed of an anodized aluminum frame covered in taut, anti-fouling netting. The netting is one-square-inch stitching made from 0.08-inch- (0.002-meter-) diameter Spectraline PLASMA 12 STRAND manufactured by Diamond Nets, Everson, WA, DuPont's preferred manufacturer for Kevlar Fiber, which comes standard with a polyurethane finish and is easily spliced. The soft, torque free braided construction of the netting provides easy handling. The Oceanspheres will be untethered to the ocean bottom, with a dynamic positioning system (DPS) that keeps the Oceansphere on station using computer-automated control employing both satellite global positioning systems (GPS)/Inertial Navigation Systems (INS) and 24/7 land-based radio telemetry control. The propulsion system includes a Persistent Oceanic Power (POP) (patent application USPTO 11/849,338) generator and duplicated x,y,z tunnel electric thrusters that will be used to position the Oceansphere.

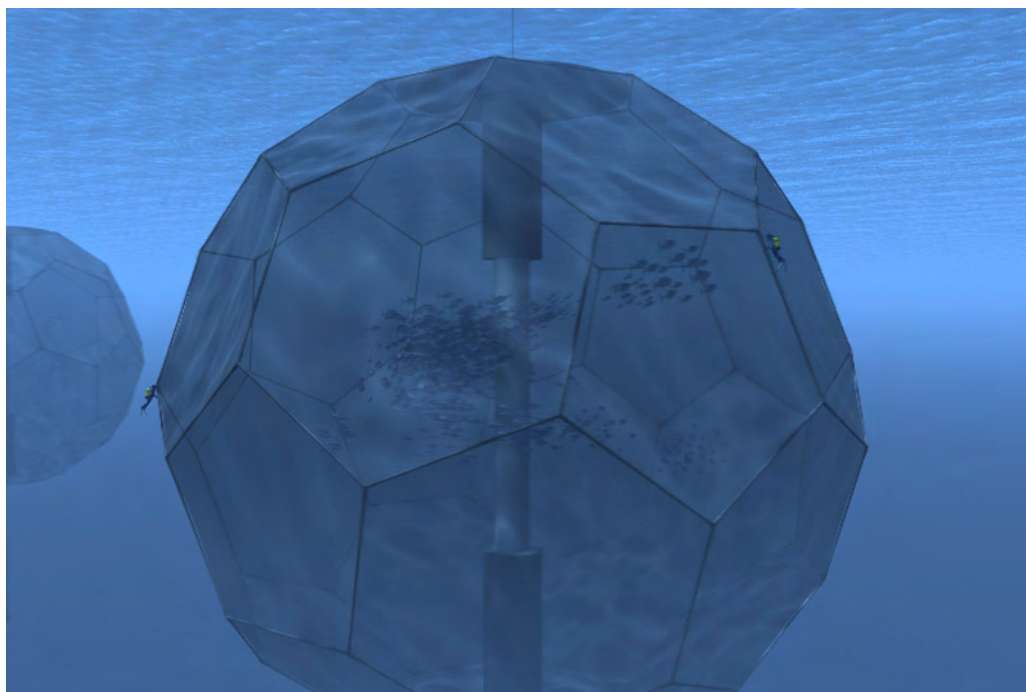
Figure 3. Oceansphere Schematic



The Oceansphere will be untethered, dynamically positioned on station using computer automated control employing both onboard satellite GPS/DPS and shore-based radio telemetry. A directed jet stream of water and shielded electric tunnel thrusters located in the central stem will be used to maintain the Oceansphere on station. The Persistent Ocean Power (POP) system will provide power for positioning, telemetry, and autonomous operation. The Oceanspheres are capable of submerging to a preprogrammed depth and staying on station using GPS/DPS, radio telemetry and INS and computer control, shown below. The Oceanspheres have broadcast radio identification tags. Figure 4 is an artist rendering of the Oceansphere. The EIS will include details on the power system and the positioning system.

Should the propulsion system malfunction the Oceansphere would automatically send a distress signal through the radio telemetry system and remain at depth until a salvage crew arrives to retrieve the Oceansphere. The Oceansphere will automatically deploy a deep sea anchor to slow drift. If the buoyancy control system should fail, the Oceansphere is positively buoyant so it would surface on its own for recovery and repair. If the propulsion system were to malfunction the backup system would radio and satellite dispatch velocity, speed, and direction of the Oceansphere to the shore based control station. A salvage crew would be immediately sent to the distressed Oceansphere. Free drifting “subsurface” floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT Professor, *personal comm.*). Also of note the Oceansphere, is mostly an empty structure with less than a 30 % surface area foot print and 70% of the current will pass directly through the mesh.

Figure 4. Open Ocean Oceansphere Artist’s Rendering.



A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area in a total systems failure, in a one knot current, the Oceansphere will most likely move less than one mile per hour, in a North West direction in a trajectory to eventually pass hundreds of miles south of Oahu. However, the Oceansphere will be recovered within a few hour of failure by the 24/7 dispatch marine salvage company, such as the work boat the “Raven” operating out of Honokohau Harbor.

Harvesting

Tuna will be harvested from the platforms at sea by landing the fish onto work boats. The harvested fish will be put on ice onboard and transported to a fish processing center. The fish will be transported to Kawaihae Harbor and transshipped to Kona, or if necessary, transported to Hilo Harbor and transshipped to Hilo for delivery to wholesalers/distributors for processing and shipping. Hawaii Oceanic Technology’s project design includes utilizing existing fish processing operations with approved waste management practices and policies. In addition, the company will work with the fish processing companies to so that they can provide its waste stream from fish processing to local companies that will convert the resource into a viable input to livestock feed, as well as a source of feedstock for renewable energy production. The byproduct is also viable source of gamma 3 fatty acids for vitamin supplement industry and may be utilized for this purpose. By managing the waste in this manner, the company intends that there will not be any addition of waste to the landfills on the island, or release of this waste stream to receiving waters of the U.S.

Current projection is that when fully operational, six Oceanspheres will be in harvest mode in any one year with a total production capacity of 6,000 tons. Fish will be harvested after reaching 100 pounds. One cage will be harvested approximately every month; all cages will be harvested once each year when fully deployed in 2012. All platforms will not be harvested at once, but will be spread out throughout the year so as not to flood the market with product. The vessels will be stocked in place and grow-out will take approximately one year. Our production schedule is estimated at 1,000 tons by 2011, 3,000 tons by 2012, 6,000 tons by 2013. A portion of the harvest will be iced and prepared for delivery to wholesalers and distributors on the Islands of Hawai‘i, O‘ahu, Maui, and Kaua‘i. Where possible, product will be put on a refrigerated delivery truck and sent to neighboring islands via container barges or the Hawai‘i Superferry. The majority of the harvest will be iced and shipped via air freight to wholesalers and distributors on the US mainland and Japan.

1.5 Environmental Process

Hawaii Oceanic Technology submitted a draft environmental assessment document for the Ahi Aquaculture Project to DLNR and received a letter of notification, dated August 8, 2008, to resubmit an Environmental Impact Statement, which is included in the appendix. The rationale presented in the letter from DLNR as the basis for recommending that the proposed project prepare an EIS rather than an EA is the scale of the proposed action and the utilization of new

technology of untethered submerged Oceanspheres in the operation of the open ocean aquaculture project.

This Environmental Document is prepared pursuant to Hawai‘i Revised Statutes, Chapter 343, Environmental Impact Statement Law and Chapter 200 of Title 11, Hawai‘i Administrative Rules, Department of Health, Environmental Impact Statement Rules. Scoping for the EIS has been ongoing with consultative meetings with relevant agencies, individual stakeholders, landowners or lessees of coastal properties adjacent to the proposed action site, long-time fishermen who utilize the area of the proposed ocean lease site, and meetings with community groups interested and knowledgeable about the ocean area of the proposed lease site. Details of the meetings to date are presented in Section 12 below.

2. Description of Existing Environment, Potential Impacts and Mitigation Measures

This chapter provides an overview of the baseline physical, biological, social, and economic conditions that occur within the region of influence (ROI) of the proposed site, and the projected environmental consequences and mitigation measures. Only those environmental and socioeconomic conditions relevant to the proposed site are presented, including the following:

- Geology, Sediments, Soils, and Topography
- Land Use and Aesthetics
- Water Quality
- Biological Resources
- Waste Management
- Traffic and Transportation
- Air Quality
- Socioeconomic Conditions
- Emergency Services, Human Health and Safety
- Cultural Resources

Each section of the EIS will describe the existing resources, methodology used for impact analysis, and factors used to determine the significance of impacts (HRS 343).

2.1 Potential Impacts

Impacts are described where they occur for each resource, including both direct and indirect impacts. Direct impacts are caused by the Ahi Aquaculture Project and occur at the same time and place, while indirect impacts are caused by the Ahi Aquaculture Project, but occur later in time or at a distance from the Ahi Aquaculture Project site.

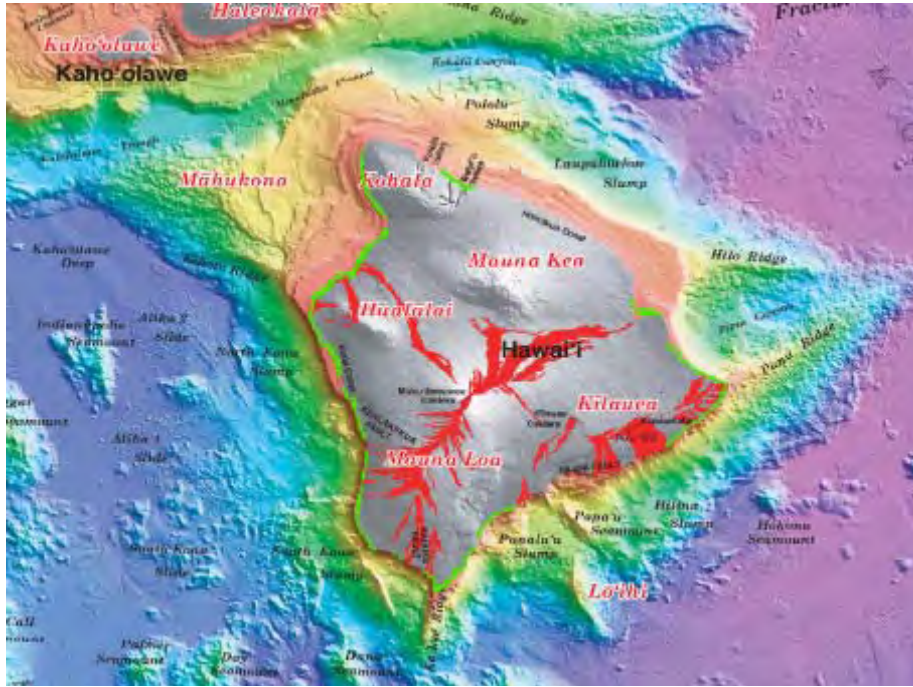
The EIS will evaluate the potential environmental impacts of the proposed action of the Ahi Aquaculture Project, as well as the Alternative 2 site, and the no action alternative. This analysis will include likely beneficial and adverse impacts on the human environment, including short-term and long-term impacts, direct and indirect impacts, as well as cumulative impacts. The analysis of impacts on resources will focus on environmental issues in proportion to their potential effects. Detailed consideration will be given to those resources that have a potential for environmental impacts. Interpretation of impacts in terms of their duration, intensity, and scale will be provided where possible. Impacts under Alternative 2 and the no action alternative will be compared against the potential impacts of the proposed action.

2.2 Geology, Sediments, Soils and Topography

The Hawaii Oceanic Technology Ahi Aquaculture Project proposed site is approximately 3 miles (2.6 nautical miles) southwest of Malae Point (Figure 1) off the North Kohala coast. Kawaihae Commercial Harbor would serve as the received, loaded into the feed canisters, and transferred to the work vessels for transport to the ocean lease site. The use of Kawaihae would be restricted to existing facilities, thus the region of influence for this resource would be limited to the ocean floor associated with the leased land and its immediate surrounding area. The geology of the Island of Hawaii will be described, and information on the ocean sediments will be presented.

The drop-off from the shoreline to deep oceanic waters off Malae Point and Keāhole Point is illustrated in Figure 5.

Figure 5. USGS Undersea Topography.

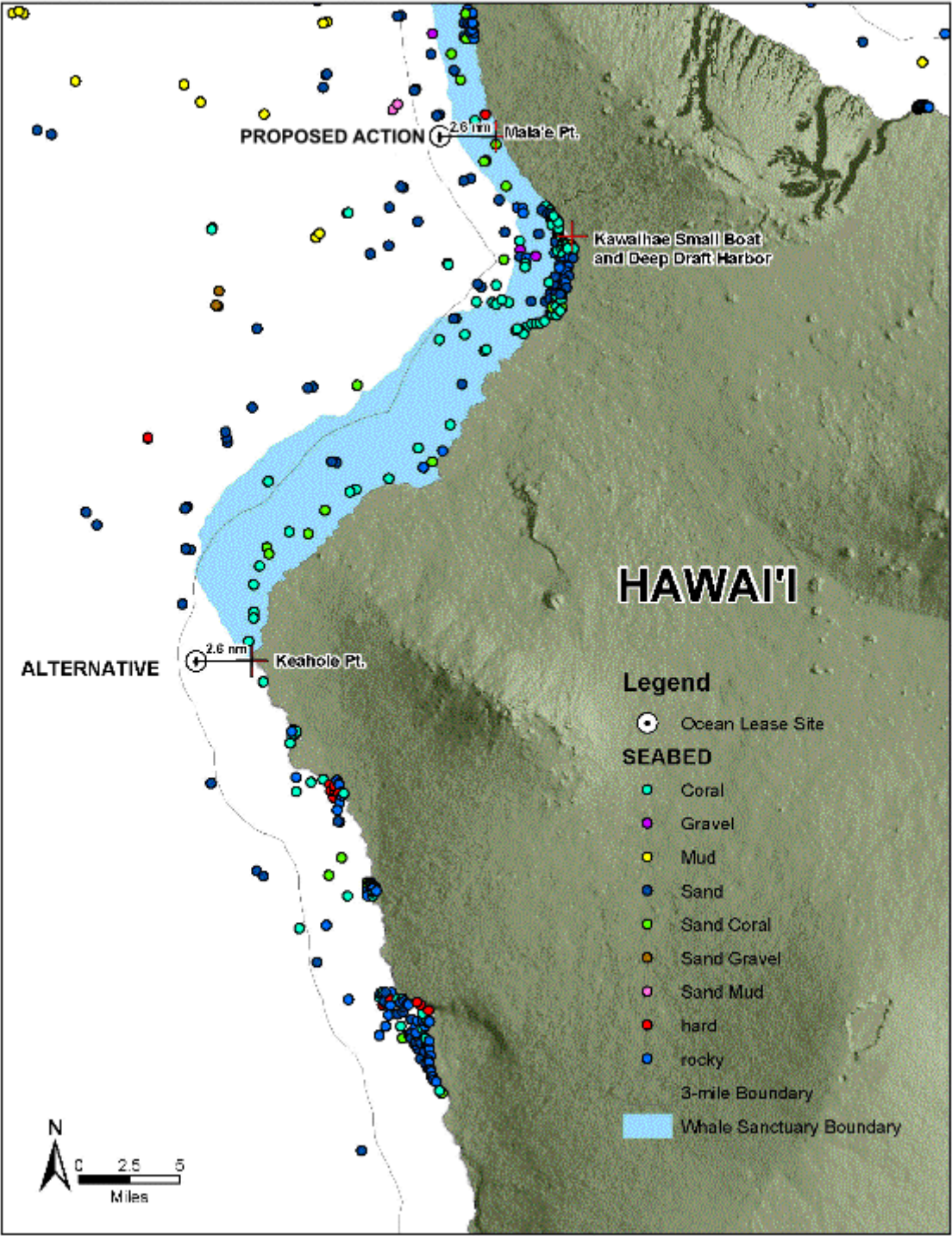


(Altom 2003)

The ocean bottom at the proposed lease site is at a depth of 1,320 feet. Bathymetric charts of the area indicate a gently sloping benthic environment with no topographical features such as seamounts or outcroppings. According to Thurman and Webber (1984), sediment on the ocean floor is generally classified as either neritic or oceanic type deposits. Neritic deposits are along the fringes of land masses and are composed of mostly lithogenous particulate matter.

Figure 6 shows the dataset of marine bottom type/seabed classifications as recorded on the nautical charts of the seabed geology off the northwestern coast of the Island of Hawai‘i (State of Hawai‘i Office of Planning GIS Database 2007). This indicates that the bottom type consists of sand. The Hawaii Undersea Research Laboratory HURL Submersible Pisces Dive Reports described the bottom type in the Northern West Hawaii coast as rock (basalt). With this information, it is assumed that the site-specific seafloor geology classification of the subject site would be rocky basalt bottom with sand areas.

Figure 6. Seabed geology off the northwestern coast of the Island of Hawai‘I
(State of Hawai‘i Office of Planning GIS Database 2007).



Environmental Consequences Impact Methodology

Impacts on geology, sediments, soils, and topography were assessed based on whether the proposed activities would alter the geology, sediments, soils, or topography of the off-shore fish platform location. Since there would be no need for harbor improvements under the proposed action, the primary impact analysis focuses on the off-shore proposed ocean lease site.

Factors Considered for Impacts Analysis

Factors that will be considered in determining whether an alternative would have a significant impact on the existing geological, sediment, soil, or topographic conditions include irrevocably or irretrievably altering the baseline environmental conditions as a result of Oceansphere placement and positioning, Oceansphere maintenance and routine operations, fish feeding activities, fish excrement, and other fish debris.

Preliminary analysis indicates that there will be no detrimental impact on the benthic environment due to natural processes that are commonly accepted among oceanographers that about 80 to 90 percent of net primary productivity is degraded to inorganic compounds (carbon dioxide, nitrate, phosphates, etc.) in the surface waters and that the remainder sinks below the euphotic zone of the deep ocean (Schlesinger 1997). As organic material descends through the water column in the ocean, bacterial degradation continues.

2.3 Land Use and Aesthetics

The proposed action is to take place at a land based site within Kawaihae Commercial Harbor, and at the proposed ocean lease site. The analysis will include both sites. The proposed location of the open ocean platforms is off the North Kohala coast of the Island of Hawai'i due south west of Malae Point. The platforms will be situated 3 miles (2.6 nautical miles) off shore within State waters and will be outside the Hawaiian Islands Humpback Whale National Marine Sanctuary area. The area proposed for leasing is 247 acres (1.0 square kilometers) and will contain 12 platforms, when completely developed, which will produce 6,000 tons (5,443 metric tonnes) of Ahi per year.

The platforms, which are 54 meters in height and 54 meters in diameter, will be evenly distributed in the 247 acre site, as shown in Figure 2. The water depth at the site is 1,320 feet (402.34 meters); platforms will be submerged at a depth of 180 feet (55 meters). Since the Proposed Action site is 3 miles (2.6 nautical miles) from shore, it will only be visible in the distance from vantage points on the coastline. Work boats will be present at the site throughout the work day; however, their presence will not affect the visual unity or visual aesthetics of the area. Buoys and lights used to mark the platforms will be the only visible part of the platform that breaks the water surface and will not be seen from far distances and will only be visible from boats traveling within the region of influence.

Environmental Consequences Impact Methodology

Impacts on land use and aesthetics will be assessed based on whether the proposed activities are consistent with state and local land use and recreation plans and compatible with the surrounding land uses.

Factors Considered for Impacts Analysis

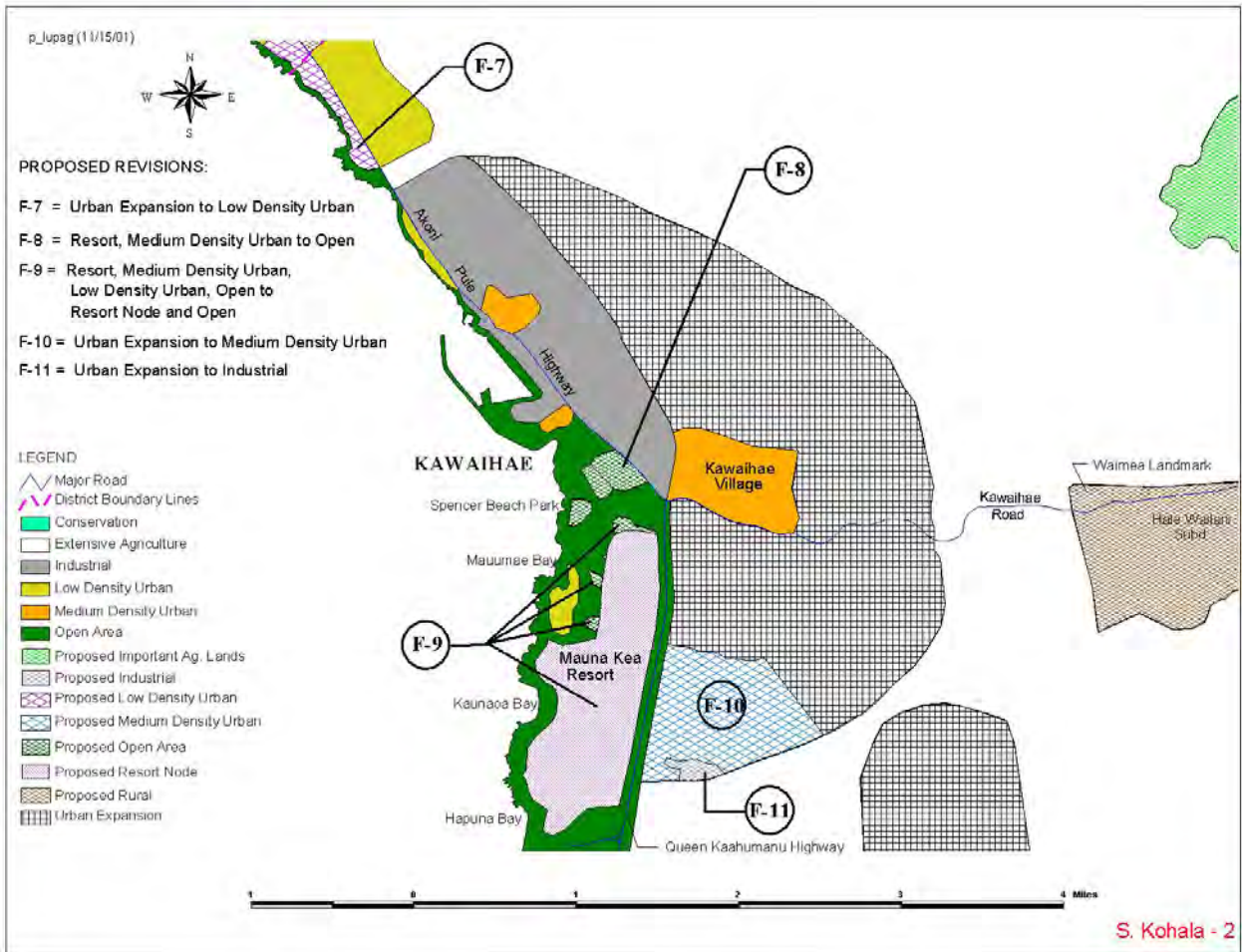
The evaluation of potential impacts on land use, including recreational resources, will be based on the project's consistency with the following:

- Existing/planned land uses or ownership;
- Unique characteristics of the geographical area (40 CFR Section 1508.27);
- The objectives, policies, and guidance of state and local land use plans;
- Recreational use of the beach, ocean, or land-based resources, such as parks or hiking paths, or the public's right of access to the sea;
- Hawai'i Coastal Zone Management Program policies; and
- The Public Access Shoreline Hawai'i vs. County of Hawai'i Planning Commission decision, which assures that Native Hawaiians can exercise traditional and customary practices on undeveloped and underdeveloped land.
- Coastal and ocean activities as described in interviews with land users and owners of adjacent coastal property to the Proposed Action site.
- Goals and objectives in the Ala Kahakai National Historical Trail draft EIS and Management Plan. (AKNHT 2007)
- Goals and objectives of the North Kohala Coastal Cultural Resource and Heritage Landscape Study (UH-DURP 2005)

2.3.1 Compatibility with existing uses

The land use at Kawaihae Harbor is designated as industrial, with open areas associated with the breakwater (Figure 7). The proposed land use of the proposed action at the Kawaihae Commercial Harbor is consistent with designated land use of the area.

Figure 7. Land Use Designations for Kawaihae Commercial Harbor.



(County of Hawai‘i 2005)

The center of the preferred ocean lease site is located directly offshore of Malae Point at 20°05' 40.00" N 155.55' 40.00" W, and the water depth is 1,320 feet (402.34 meters).

The Malae Point area is exposed to heavy north and west ocean swells, which occur primarily over the winter months (November - March). Strong trade winds also are prevalent in winter and blow generally from the north or northeast. Recreational use of the ocean area around Malae Point is therefore less during winter months.

State Land Use classification for the Proposed Action ocean lease site is Conservation, in a Resource subzone. This Proposed Action is an identified land use in the Resource Subzone of the Conservation District, pursuant to Section 13-5-4, Hawaii Administrative Rules (HAR), R-1, Aquaculture, D-1: “aquaculture under an approved management plan.”

2.3.2 Visual resources

The area proposed to be used at Kawaihae Commercial Harbor is already zoned industrial and surrounded by other commercial harbor activities. The proposed action will not result in any noticeable changes to visual resources in the harbor area.

The views of the proposed ocean lease site from shore are of open ocean, with fishing vessels and other vessels transiting the area. Most vessel traffic is close to shore for fishing purposes. Interisland barge traffic passes these waters in areas further offshore from the proposed lease site. The properties along the adjacent shoreline at Malae Point include open space and ranchland. There are no residential areas nearby. Areas further mauka are ranch land, primarily owned or leased by Kahua Ranch.

To help determine the potential impact of the proposed action on visual resources, interviews with the land owners and users of the adjacent shoreline are being conducted. Preliminary conclusions from these interviews indicate that there will be no significant negative impact on visual resources by the proposed action. Reasons given in the interviews for this conclusion include the distance of the proposed site from shore, the platforms are submerged most of the time, the work boats and tops of the platforms will fit right in with the other boat traffic in the area, the navigation light is only visible two miles from the site, and the coastal area is not used for residential purposes.

2.3.3 Recreational Resources

Surveys of the vessels using the area are being carried out to characterize the recreational use of the proposed ocean lease site. These surveys will be primarily shore based using methodologies commonly used for marine mammal surveys. These data will be supplemented by some vessel-based surveys of the area. In addition, surveys of area fishermen and other boaters are being completed to gather more information with which to characterize the site.

Preliminary conclusions from survey data indicate that there will be no detrimental impacts to recreational activities, which are primarily fishing and boating that takes place within 1 to 1 ½ miles from shore. Opelu fishing is primarily within ½ mile of shore. Coral reefs are within ½ mile of shore. Trolling is primarily within 1 to 1 ½ miles from shore following the 30m or 40 m depth contour. Bottom fishing takes place out to a depth of about 150 to 160 fathoms, which is shallower than the depth at the proposed lease site of 220 fathoms, and located about one mile from the proposed lease site.

2.3.3 Noise

The proposed action includes operations at a land-based site at Kawaihae Commercial Harbor in an area already zoned industrial and surrounded by industrial land and activities. The additional

noise from these land operations will be evaluated, but is not expected to add any noticeable increase to ambient noise at the harbor.

The proposed action also includes the ocean-based operation at the proposed lease site. These operations will include deployment of the Oceanspheres, maintenance and cleaning of the structures, and feeding and harvesting of the fish. The noise from these operations will be analyzed, but is not expected to be any different from other vessel operations in the area. The distance from shore will also be evaluated as to its lessening of any noise being audible from the shore.

2.4 Water Quality

Through the administration of the Clean Water Act (CWA), the Hawai‘i Department of Health Clean Water Branch (HDOH CWB) protects and restores Hawai‘i coastal and marine waters for residents, tourists, and marine life. In regards to this proposed project, the HDOH CWB is responsible for issuing the required National Pollution Discharge Elimination System (NPDES) permit, approving the required monitoring program of the water adjacent to the project site, and analyzing water quality and operational data to determine compliance. The HDOH CWB also has the power to issue fines if water quality standards are exceeded.

The waters of the proposed action site are listed as Class A waters, and as such, the state protects them for recreational use and aesthetic enjoyment. Other uses, including this proposed action, shall be permitted as long as they are compatible with the protection and propagation of fish, shellfish, and wildlife. Discharge of waters from the platforms into the surrounding waters must receive the best degree of treatment or control, and be covered by a NPDES general permit, approved by the US EPA and issued by the HDOH in accordance with 40 CFR Section 122.28 and all applicable requirements specified in HAR Chapter 11-55, titled “Water Pollution Control.”

In addition to water quality, the NPDES permit covers impacts to the marine bottom. While the seafloor below the proposed action site does not fall within the specific definitions for marine bottoms, it most closely resembles the definition for “soft bottom community,” a class II designation. These are protected for the propagation of fish, shellfish, and wildlife, and so as not to limit recreational purposes in any way. Any action that may permanently or completely modify, alter, consume, or degrade marine bottoms may be allowed upon securing approval in writing from the director, considering the environmental impact and the public interest (HAR Ch. 11-54: Water Quality Standards). This statute includes regulation of a wide variety of metals, poisons, and other pollutants, nutrients and physical water quality parameters (i.e., salinity, temperature, turbidity, pH, oxygen and chlorophyll).

The ocean off the Kohala coast of the Island of Hawai‘i is sheltered from the prevailing northeasterly trade winds by the 5,480-foot (1,670 meter) Kohala mountain, and the nearby 13,796-foot (4,205-meter) Mauna Kea and 13,678-foot (4,169-meter) Mauna Loa, providing

relatively calm waters all year round. The seafloor descends quickly from the coast, providing a relatively small area of coral reef habitat that hugs the coastline. The benthic habitat maps of the Kohala Coast provide an accurate representation of these resources, showing that the coral reef extends approximately 0.54 nautical mile from shore at its widest point and less than 0.14 nautical mile in most places along the coast (Coyne et al. 2003). While the Kohala Coast experiences relatively little rainfall (10 inches [254 millimeters] per year), upslope rain percolates into the porous rock, ultimately flowing into the ocean as submarine discharge of groundwater, which shape the coastal and nearshore marine ecosystem.

The area of the proposed project, 3 miles (2.6 nautical miles) due south west of Malae Point in Kohala, is well away from the reef environment and any fresh water influences. The site for the Proposed Action is located in 1,320 feet (402.34 meters) of water. The Proposed Action site is 3 miles (2.6 nautical miles) from shore, 247 acres (1 square kilometer) in diameter and at least 2.3 miles (2 nautical miles) from the nearest reef. While support activities will occur on land and in near shore waters (e.g., transiting to the site), the description of the existing water quality and the impacts from the proposed project will be focused on this offshore environment, except where the best available scientific information and interpretation warrant an expansion of the discussion to the near shore.

Environmental Consequences Impact Methodology

The Draft EIS will include specific information on the oceanographic conditions of the proposed action site including physical and chemical characteristics of the water column including temperature, salinity and nutrient concentrations, as well as currents. This information will be gathered from existing relevant studies, as well as on site sampling of water quality and currents. The water quality parameters will provide a baseline, and will include sampling at the proposed action site, as well as a control site located one mile up-current of the proposed site. Data from three depths will be provided including surface conditions, the approximate depth of the Oceansphere, and the approximate depth from where the colder waters will be drawn to operate the hybrid Ocean Thermal Energy Conversion (OTEC) engine. These parameters include Total Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite, Orthophosphate, Total Phosphorus, Dissolved Oxygen, Turbidity, pH, Temperature and Salinity. The quality assurance and quality control protocols for the sampling will also be included.

Information on currents will be provided from existing data sources, as well as data from on-site current monitoring. A specific analysis of both sets of data will be included in the EIS to best characterize the site's currents. This will also include a description of the gyres or eddies that may occur in the area of the proposed action site.

With the information on the baseline water quality and average currents at the proposed action site, a "zone of mixing water quality model" will be prepared for the 247 acre (1 square kilometer) area and a 492 feet (150 meter) deep operating volume, and its conclusions presented in the EIS. The model will use published data on nitrogen and phosphorus discharge from open ocean marine fish aquaculture being fed comparable fish feed pellets. The results from the zone of mixing model will be compared with the State of Hawaii water quality standards.

The potential impacts of the proposed action on water quality will be evaluated based on empirical data gathered from existing operations, and peer-reviewed scientific environmental impact analyses available in the literature.

Factors Considered for Impacts Analysis

Marine water quality is governed by both federal and state laws and regulations. Federal authority rests primarily with the USACE and the US EPA. While the USACE is primarily concerned with issuing permits for structures located in navigable waters, they also consider impacts to the environment through its “public interest review” of Section 10 permits. The US EPA has regulatory authority of aquaculture facilities, categorized as “concentrated aquatic animal production facilities” under the CWA. Based on this categorization, open ocean aquaculture facilities are listed as point sources of pollution and must obtain a NPDES permit when production reaches 100,000 pounds per year.

NPDES permits are issued by HDOH CWB. Minimum water quality standards are codified in HRS Chapter 342D, Water Pollution, and HAR 11-54, Water Quality Standards. Minimum standards are allowed to be exceeded within the Zone of Mixing (ZOM), which is determined and defined during the NPDES permit process. For the purpose of this section, factors considered for impact analysis include the following:

- HRS 342D and HAR 11-54;
- Requirements described in the NPDES permit application and associated ZOM model;
- CWA of 1972;
- Data and analyses of existing OOA operations in Hawai‘i; and
- Scientific literature on the natural fluctuations of nutrient and phytoplankton concentrations in the waters off the Kona Coast.

Potential Impacts and Mitigation Measures

Based on the water quality monitoring programs and experience of comparable open ocean aquaculture projects, it is anticipated that there will be little impact on water quality outside the Zone of Mixing. The strong currents in the region of influence, constant mixing of the surface mixing layer, placement of the platform’s center-point at 180 feet (55 meters) depth, 2 ½ -mile (2.2-nautical mile) distance from coral reefs and 1,320-foot depth of the water at the site all indicate that there will be negligible impacts on water quality in the immediate vicinity of the platforms. This EIS will include results of existing water quality monitoring programs, as well as results from on-site water quality monitoring programs, and a Zone of Mixing water quality model. To ensure compliance with State water quality standards, the EIS will describe the water quality monitoring program that will be carried out under the proposed action.

2.5 Biological Resources

This section describes biological resources found to occur in the region of influence, which is in or adjacent to the Proposed Action ocean lease site, which is in state waters. Since many of the marine species discussed in this section are wide ranging and can be found in adjacent federal waters (3-200 nautical miles), the description of the resources is effectively the same for state and federal waters. Because the site is 2.6 nautical miles from shore in 1,320 feet (402 meters) of water, near shore biological resources, including corals, reef fish, benthic algae, and other reef-associated fauna will be discussed as a community and not in species-specific detail.

The region of influence for terrestrial resources is more narrowly defined, because land-based activities at the Kawaihae Commercial Harbor, Hilo Harbor, and on public roads, for the Proposed Action are trivial and include daily driving within the Kawaihae Harbor area, service trucks, delivery trucks, and other work vehicles driving to and from the company's leased equipment storage and office site, boat launching, vessel and equipment wash down, and product transshipment from the harvest vessel to trucks for transport to Kona. These activities are similar in type and scope to activities occurring every day by hundreds of residents of the island. As such, describing the inventory of terrestrial biological resources in the region of influence is not beneficial in analyzing the impacts of the proposed action.

Biological resources include plant and animal species and the habitats or communities in which they live (i.e., vegetation species and communities, general wildlife, sensitive species and habitats, and wetlands).

Natural resources were evaluated in accordance with applicable provisions of numerous statutes and regulations, executive orders, and permits. Species are identified as federally listed if protected by the Endangered Species Act (ESA), and as state-listed if considered to be threatened or endangered species by the State of Hawai'i. Relevant biota can be divided into three types: terrestrial biota, marine biota, and rare, threatened, or endangered species. The effects of the proposed project on rare, threatened, or endangered species or their habitats are considered independently, in light of the regulatory requirements of the Migratory Bird Treaty Act, the Marine Mammal Protection Act (MMPA), and the ESA.

Regarding terrestrial biota, there are no endangered or threatened terrestrial plant or animal species at the Kawaihae Commercial Harbor, where the land-based operation will be located. As such, the proposed action is not expected to have any impacts on terrestrial biota.

Regarding marine biota, it is important to recognize that the proposed action is a "closed loop" aquaculture operation, which means the ahi fingerlings will be grown out from eggs collected from broodstock caught in coastal waters off the Island of Hawaii and will be supplied in collaboration with the Pacific Aquaculture & Coastal Resources Center (PACRC). The tuna will be hatched at PACRC and grown to Oceansphere transferable size in land-based tanks. Through this process, the impact of the proposed action on the local ahi fishery will be minimized.

The Draft EIS will include discussion of fishery data gathered from interviews with long-time fishermen who utilize the area in the proposed ocean lease site in Kohala. The different fisheries that will be described and analyzed will include shoreline fishing, the opelu fishery, trolling fishery for mahimahi and ono, and the bottomfish fishery. For the bottomfish fishery, specific attention will be paid to the Essential Fish Habitat, and the designated Habitat of Particular Concern. Preliminary conclusions from this analysis indicate that the proposed action site (1,320 feet deep and 3 miles offshore) is in deeper water and further offshore than the opelu fishery (located in waters about ½ mile from shore), the mahimahi and ono trolling fishery (located in areas running parallel to the shoreline at about the 30m depth contour, which are between ½ mile and about 1-½ miles from shore), and the bottomfish fishery (located in waters of less than 1000' depth, which extend out to about 2 miles from shore).

In addition, data will be included from comprehensive surveys of reef fish, coral reef and associated algae and invertebrates conducted in coral reef areas located in the nearshore waters adjacent to the proposed site.

Additional species that will be analyzed in the Draft EIS will include sharks, deep water corals, dolphins, humpback whales, Hawaiian monk seals, green sea turtles, and hawksbill turtles.

Environmental Consequences Impact Methodology

Potential direct and indirect impacts on biological resources were analyzed for general biological resources, along with sensitive species and any biologically sensitive areas, designated critical habitat, or Essential Fish Habitat. For this analysis, specific potential impacts on biological resources are based on the following:

Comparing the location of such resources in relation to the physical locations of the proposed actions to determine potential direct and indirect impacts on these resources;

- Examining the types and intensity of activities proposed in each location to determine the potential for impacts on these resources;
- Relative importance or value of the resource affected, for example its legal, commercial, recreational, ecological, or scientific value;
- The resource's relevant occurrence in the region;
- Sensitivity of the resource to the proposed action;
- Anticipated physical extent of the potential impact; and
- Anticipated duration of the ecological ramifications of the potential impact.

Direct impacts may be short term or long term, depending on how the biological resources are affected during the course of the project implementation and operation. Direct negative impacts result when biological resources or habitats are altered, destroyed, or removed during project implementation.

Indirect negative impacts to biological resources may occur if project activities result in environmental changes that indirectly influence the survival, distribution, or abundance of species. Examples of indirect negative impacts may include effects of noise, presence of chemical contamination, decline in water quality, or incidence of human activity levels that may disturb or harm wildlife.

Factors Considered for Impacts Analysis

Impacts were assessed based on whether the proposed action would result in the following:

- If a population of a threatened, endangered, regulated, or other sensitive species was adversely affected by reduction in numbers or by alteration in behavior, reproduction, or survival;
- The “take” of a listed or sensitive resource, such as a threatened or endangered species as defined in the ESA or a species protected by the MMPA;
- Loss of a substantial number of individuals or any of a nonlisted species or loss that could affect abundance or diversity of that species beyond normal variability;
- Substantial adverse effect on a species, natural community, or habitat that is specifically recognized as biologically significant in local, state, or federal policies, statutes, or regulations;
- A jeopardy biological opinion by the USFWS or NOAA Fisheries;
- A reduction of the population of a sensitive species;
- An adverse effect on Essential Fish Habitat (EFH);
- Interference with the movement of any native resident fish or migratory wildlife or migratory wildlife corridors;
- Conflict with Hawai‘i Coastal Zone Management Program policies;
- Introduction of or increases in the prevalence of undesirable nonnative species;
- Allows biological resources to be exploited in ways inconsistent with the plans and policies of the NMS program or that would otherwise violate the NMS or NOAA program regulations; or
- Long-term loss or impairment of a substantial portion of local habitat (species-dependent).

Potential Impacts and Mitigation Measures

Since the land-based operation is in the existing commercial harbor, it is anticipated that the proposed action will have no impact on terrestrial flora and fauna.

Since the coral reefs are over 2 ½ miles from the proposed action site, and the changes in water quality from nutrients and particulate matter from the proposed action are not anticipated to extend beyond the Zone of Mixing of the proposed ocean lease site, it is anticipated that there will be no impact on coral reefs from the proposed action.

There will likely be a fouling growth of marine benthic fauna on the platforms and associated apparatus, that would probably include bivalves (several species of mussels and oysters [*Pteria* and *Pinctada* spp]), corals (*Pocillopora* and *Porites*), sea urchins (*Echinothrix calamaris*), nudibranchs (*Stylocheilus longicauda*), and sponges. These would all settle out of the natural plankton. The potential impact of this will be discussed in the EIS, including the biological and physical processes that will occur to this material in the water column and on the seabed. It is anticipated that the amount that would reach the barren seafloor would spread across a wide area and would be inconsequential to this habitat.

Because the proposed action is to be located 2.6 nautical miles from shore in waters over 1,300 feet deep, it is anticipated that it will be too far from shore to affect reef fishes. Experience with comparable open ocean aquaculture operations and interviews with opelu fishermen will be used to determine the potential impact on nearshore fisheries such as opelu. It is anticipated that the opelu may be attracted to the Oceanspheres, but would probably not remain at the platforms for any duration. Therefore, the proposed action does not appear that it will have any impact on reef fish or opelu.

It does appear that the Oceanspheres will probably attract carnivorous pelagic fish, such as kawakawa (*Euthymnus alletteratus*), yellowfin ahi (*Thunnus albacares*), ono (*Acanthocybium solandri*), and mahimahi (*Coryphaena hippurus*). These are targeted by the trolling fishery, which tends to follow the 30 – 35 fathom contour parallel to the shoreline. Across the state, FADs increase catch rates for those who use them. Hawaii Oceanic Technology intends to provide local fishermen access to fish around the Oceanspheres so they can benefit from any increase in these fish in the area. However, impacts to these fish are expected to be less than significant. The catch will likely increase in the project area, but it will be within the natural variance of catch rates.

The proposed action site is about a mile away and in waters 300 feet deeper than the deepest waters targeted by bottom fish fishermen, and in waters about 400 feet deeper than the area designated by federal authorities as a Habitat Area of Particular Concern for bottomfish. Therefore, it is anticipated that the proposed action will not have a significant impact on the bottomfish fishery. Nonetheless, bottomfish fishermen are being interviewed to ascertain their opinion about the potential impact of the platforms on the distribution of bottom fish, and the general state of the bottomfish fishery.

There are a few conceivable ways for this proposed action to negatively impact rare, threatened, endangered, or protected species, such as whales, dolphins, monk seals or turtles. The project does not present a significant obstruction to animal movements and there are no mooring lines or loose hanging nets to entangle the animals. There are no data available to support any conclusions on either short-term or long-term behavioral impacts to larger marine wildlife species. The proposed action site is outside the Hawaiian Islands Humpback Whale National Marine Sanctuary, and not near any known spinner dolphin resting area.

The EIS will discuss how the natural behavior of some animals, such as dolphins, may be altered, either in the short term or over time, by the byproducts of the presence of the platforms themselves or by the maintenance activities associated with the platforms. As a means of preventing any negative impacts on these species, the proposed action proposes to include a monitoring and management plan concerning any interactions with marine mammals, sea turtles, and sharks. This monitoring and management plan will be developed in consultation with the regulatory agencies from the State and Federal government.

2.6 Waste Management

This section of the EIS will address hazardous materials and conditions, such as the use and storage of hazardous materials and wastes within the region of influence. The region of influence for this resource includes all harbor structures and facilities used by the proposed open ocean aquaculture operation and the proposed leased ocean areas for the offshore ocean platform site.

No new structures will be constructed at the harbors for the purpose of this project; this project will use existing facilities and structures within the harbors.

According to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a hazardous substance can be defined as any substance that, due to its quantity, concentration, or physical and chemical characteristics, poses a potential hazard to human health and safety or to the environment. CERCLA has created national policies and procedures to identify and remediate sites contaminated by hazardous substances.

The EIS will include sections to address specific hazardous materials and conditions of concern related to materials and wastes that may be used, stored, or transported within the region of influence. Hazardous materials and wastes can affect the environment and often have specific regulations that govern their use, storage, and disposal. The specific human health and safety hazards addressed are the potential for human exposure to gasoline, oils, lubricants, greases, paints, and other hazardous substances involved in boat maintenance.

Personnel hired by Hawaii Oceanic Technology will have experience in vessel operations and maintenance, and are adept at managing exposure to the range of hazardous materials that are commonplace with boat operations and maintenance. At the project site in Kawaihae Harbor, there are no known hazardous materials, wastes, or other threats to human health or safety. Minimal amounts of paints, solvents, hydraulic fluids, lubricants, oils, and fuels needed for

everyday use and minimal maintenance activities for the three work boats, trailers and three large pickup trucks will be kept on site in accordance with all safety requirements. Major boat and truck repairs will be done at an off-site commercial facility and will not introduce any hazardous wastes beyond everyday levels. The underwater proposed location for the aquaculture operation does not contain any known hazardous materials or wastes. No hazardous materials will be produced by the proposed action. The work vessels will contain all the oil spill prevention and response equipment required by U.S. Coast Guard regulations for such vessels.

Hawaii Oceanic Technology's project design includes utilizing existing fish processing operations with approved waste management practices and policies. In addition, the company will work with the fish processing companies to so that they can provide its waste stream from fish processing to local companies that will convert the resource into a viable input to livestock feed, as well as a source of feedstock for renewable energy production. By managing the waste in this manner, the company intends that there will not be any addition of waste to the landfills on the island, or release of this waste stream to receiving waters of the U.S.

Environmental Consequences Impact Methodology

Numerous federal, state, and local laws regulate the storage, use, recycling, disposal, and transportation of hazardous materials and waste. The methods for assessing potential hazardous materials and conditions and impacts generally include the following:

- Reviewing and evaluating the proposed actions to identify the action's potential to use hazardous or toxic materials or to generate hazardous waste, based on the activities proposed;
- Comparing the location of proposed actions with baseline data on known or potentially contaminated areas;
- Assessing the compliance of proposed actions with applicable site-specific hazardous materials and waste management plans; and
- Assessing the compliance of proposed actions with applicable site-specific standard operating procedures and health and safety plans in order to avoid potential hazards.

Factors Considered for Impacts Analysis

Regulatory standards and guidelines have been applied to determine the significance of each alternative's potential impact from non-chemical hazards and hazardous materials and waste. Factors considered in determining whether the Proposed Action or the Alternative 2 would have a significant impact from hazardous materials and conditions include the extent or degree to which its implementation would result in the following:

- Generate either hazardous or acutely hazardous waste, resulting in increased regulatory requirements over the long term;

- Cause a spill or release of a hazardous substance (as defined by 40 CFR Part 302 [CERCLA], or Parts 110, 112, 116, and 117 [Clean Water Act]);
- Expose the environment or the public to any hazardous condition through release or disposal;
- Require the removal or upgrade of an underground storage tank;
- Endanger the public or environment during the storage, transport, or use of hazardous substances; and
- Expose the public to electromagnetic fields with cycle frequencies greater than 300 Hz.

Potential Impacts and Mitigation Measures

No hazardous materials will be stored or handled at the project's work site location at Kawaihae Commercial Harbor. Any hazardous materials used for boat maintenance or repair would occur offsite at a commercial marine maintenance facility, which would have its own systems for handling, storing and disposing of hazardous materials and wastes generated, in accordance with local and state hazardous materials and waste regulations. All waste generated in fish processing will be handled by the commercial fish processing companies that will be contracted to provide this service to the company.

To minimize any potential of impacts from oil spills, the operations of the work vessels and Oceanspheres would include an oil spill prevention and response plans, equipment and trained personnel to properly handle any situation that may arise. These topics will be fully analyzed in the EIS. Based on the experience of other comparable open ocean aquaculture operations, and the operational design of the proposed action, it is anticipated that the proposed action will have no significant impact on the environment relating to hazardous materials or wastes, and will have no impacts on the environment resulting from fish waste or solid waste.

2.7 Traffic and Transportation

The EIS will evaluate the impacts of the proposed action on the traffic and transportation system in the proposed ocean lease site, the ocean area between the proposed lease site and the Kawaihae Commercial Harbor base of operations, the Kawaihae Commercial Harbor itself and roads leading to the harbor. Containers of feed would be delivered by barge to the OOA site and stored on site. When fully operational the company will require 2,000 tons (1,814 metric tonnes) of feed stock per month arriving in 80 containers. This supply will be received at Kawaihae Harbor. The food would be delivered by boat to the open ocean operations area twice per month.

When fish is harvested from the open ocean platforms, the work vessel will return the fish to Kawaihae Commercial Harbor and offload the fish to refrigerated trucks, which will transport the fish to Kona for processing at an existing fish processing facility, then transshipped to Kona

International Airport for air shipment to off-island markets. A limited number of fish will be transported by refrigerated truck to Oahu and other Hawaiian Islands by the Hawaii Superferry, or by air freight. Shipping products via air freight will utilize existing air freight flights and will not affect the existing air traffic conditions.

Impacts Assessment Methodology

Road traffic will be evaluated using existing data from Hawaii Department of Transportation Highways Division regarding the level of use of the roads leading to Kawaihae Harbor. The incremental increase in the number of vehicles using these roads as a result of the company's employees, service trucks and delivery trucks will be evaluated and its potential impact determined.

Marine vessel traffic will be determined by a vessel survey of the proposed action site, along with consultation with U.S. Coast Guard and Hawaii DOT-Harbors officials.

Factors Considered for Impacts Analysis

The criteria for assessing effects on traffic conditions in the region of influence will include reviewing and interpreting baseline traffic conditions and applying the projected traffic contributions that may be generated as a result of the proposed action. Traffic factors will include volume, level of service, and volume to capacity ratio. Level of Service (LOS) refers to a standard measurement used by transportation officials and reflects the relative ease of traffic flow on a scale of A to F, with free-flowing conditions rated as LOS A and congested conditions rated as LOS F (Transportation Research Board, 2000). Volume capacity ratio (V/C) measures traffic demand on a facility (expressed as volume), compared to the traffic carrying capacity. In other words, this is the ratio of the level of vehicular travel for a roadway to the amount of designed capacity on the roadway. A volume capacity ratio of 1 means the roadway is functioning at capacity and congested conditions are expected.

Significance is determined if the traffic from the proposed action would result in a decrease of the baseline LOS rating for the affected roadways or intersections. In other words, if the proposed action was to generate traffic volume so as to increase congestion in the region of influence, then that would be deemed a significant impact on traffic conditions.

Potential Impacts and Mitigation Measures

Based on the minor increase in number of vehicles from employees, and service and delivery trucks, it is anticipated that the proposed action will have no significant impacts on road traffic. The EIS will include the detailed results of the Traffic Impact Analysis and its conclusions. Regarding ocean traffic, the proposed action would not interfere with the lanes of traffic for the Kawaihae Commercial Harbor, which currently operates below capacity. Operations of the work vessels at the proposed ocean lease site are further offshore from the nearshore waters where most vessel traffic is observed fishing and SCUBA diving. Vessel surveys at the proposed action

site will be presented in the EIS, which have indicated that barge traffic lanes are further offshore from the proposed ocean lease site. Based on this, it is anticipated that the operations of the proposed action will not have any impact on marine traffic.

2.8 Air Quality

The region of influence for the proposed project depends on the pollutant and types of emission sources. Most primary pollutants are local, meaning the highest concentrations occur close to the source and disperse downwind with decreasing concentrations. Examples of primary air pollutants are carbon monoxide (CO) and particulate matter. Ozone is a secondary pollutant formed in the air as its precursors interact. Typical emission sources in Hawai‘i include large and small industrial and commercial sites, transportation sources such as on-road and off-road vehicles that contribute mainly to fugitive dust; vehicle, tilling, processing, and field-burning emissions related to agricultural activities; and natural emission sources such as volcanoes (vog).

The primary focus on air quality issues for this evaluation is the potential fugitive dust emissions from increased vehicle and boat activity associated with Hawaii Oceanic Technology operations. For such sources the region of influence is typically a limited area within a short distance of any of the operation area boundaries, which is primarily Kawaihae Commercial Harbor (Figure 7) and the Proposed Action site off Malae Point (Figure 1).

Impact Assessment Methodology

Potential air quality impacts from the proposed actions can be evaluated by comparing the emissions expected to result from the proposed changes in the activity levels on the Island of Hawai‘i to current activity levels. Although the proposed action would not result in new emission source types or change the types of activities, open ocean aquaculture operations would increase the number of vehicles associated with operations compared to the current levels.

Air quality will be discussed to determine any effects that may be generated by the proposed action, and to determine if these effects will potentially be significant. This will include an evaluation of any potential impacts on air quality during the construction and deployment of the Oceanspheres, and the daily maintenance, feeding, operations and harvesting of the ahi.

Climate can be affected by greenhouse gas emissions generated by human and natural sources. An analysis will be done of the levels of greenhouse gases generated by the proposed action relative to the greenhouse gas emissions generated by fishing fleets in the wild capture ahi fishery for the equivalent amount of ahi, and also by land-based production of a comparable amount of animal protein.

Factors Considered for Impact Analysis

Factors considered in determining whether the proposed action would have a significant impact on air quality will include the following:

- Whether or not a reasonable potential exists to violate an ambient air quality standard; and
- Whether or not potential emissions are localized and temporary.

Potential Impacts and Mitigation Measures

Based on experience of other open ocean aquaculture operations and the operational design of the proposed action, it is anticipated that the proposed action is not likely to have any significant adverse impacts. A detailed analysis of this will be presented in the EIS.

2.9 Socioeconomic Environment

The socioeconomic indicators used for this study include regional economic activity (business activity, employment, and income), population, housing, schools. In addition, environmental justice and protection of children will also be addressed. These indicators help to characterize the region of influence. For the purpose of this analysis, a region of influence is a geographic area selected as a basis on which social and economic impacts of project alternatives are analyzed. The region of influence will include nearby trade and service centers related both directly and indirectly to the economic activities of the proposed Ahi Aquaculture Project, including Kawaihae (land based office and base yard at Kawaihae Harbor where employees will be based), Kona (location of fish processing company and airport used for shipping), and Hilo (site of hatchery, and transshipping hatchlings through Hilo Harbor). Based on these criteria, the region of influence for socioeconomic impacts is the entire Hawai'i County, where the land based operations of the proposed project would take place.

Socioeconomic resources include population, employment, income, housing, and schools. The population data include the number of residents in the area and the recent changes in population growth. Data on employment, labor force, unemployment trends, income, and industrial earnings describe the economic health of a region. The number and type of housing units and schools can be indicators of the regional quality of life. The EIS will include a description of the proposed project's affiliation with University of Hawaii at Hilo, University of Hawaii Manoa, Massachusetts Institute of Technology, Hawaii Undersea Research Laboratory, Hawaii Institute of Marine Biology and the Oceanic Institute, and how the company is collaborating with these institutions on research and training students as prospective employees.

Impact Methodology

The region of influence for the proposed action will be defined as Hawai‘i County (Island of Hawai‘i). The proposed action will be reviewed and evaluated to identify potential impacts (beneficial or adverse) on conditions in the region of influence. For the proposed action, impacts on population, employment, income, business volume, housing, and schools will be evaluated qualitatively.

Environmental justice is the fair treatment of people of all races, cultures, and income with respect to the development, implementation and enforcement of environmental laws, regulations, programs, and policies. Fair treatment means that no racial, ethnic or socioeconomic group bears a disproportionate amount of the negative environmental consequences of a proposed action. To fully analyze this, it is important to involve government agencies, any affected native peoples, minority ethnic groups, and other interested stakeholders in the process of developing the environmental impact statement.

Factors Considered for Impacts Analysis

Factors that will be considered in determining whether an alternative would have a significant impact on socioeconomics include the extent or degree to which its implementation would result in the following:

- Change the unemployment rate for Hawai‘i County;
- Change total income;
- Change business volume;
- Change the demand on housing;
- Change school enrollment;
- Result in disproportionate impacts on minority and low-income population; or
- Result in risks on the health and safety of children.

Potential Impacts and Mitigation Measures

While the proposed action will create jobs and bolster local economic activity in the region of influence, the increase in employment, income and business sales volume from the proposed action is expected to be minor. The EIS will include a detailed analysis of this issue, including employment, housing, schools, environmental justice and protection of children. It is anticipated that the proposed action will cause less than significant social and economic impacts in the region of influence.

2.10 Emergency Services, Human Health and Safety

Public and worker health and safety issues include potential hazards related to underwater diving operations, particularly the failure of SCUBA equipment and shark attacks.

The majority of personnel who would be employed as part of the Proposed Action are already working in the fishing or marine industry. As such, these employees would already be involved in underwater operations prior to employment with Hawaii Oceanic Technology. The personnel would have been trained in managing their SCUBA equipment and would be knowledgeable of the dangers of shark attacks and other ocean-related safety and emergency procedures. When people are properly trained and exercise good judgment, SCUBA diving is a relatively safe activity. Dangers that may be encountered while SCUBA diving include Barotrauma risks, non-Barotrauma risks, and physical and health hazards (SCUBA Guide 2007).

Barotrauma risks include alternating baric vertigo, altitude sickness, barodontalgia, decompression sickness (known as “the bends”), dysbaric osteonecrosis, embolism, arterial gas embolism, cerebral embolism, lung expansion injury, pneumomediastinum, pressure arrhythmias, tinnitus, Eustachian and inner ear damage, and Tympanic membrane rupture and/or hearing loss (SCUBA Guide 2007). Non-barotrauma risks include carbon dioxide toxicity (hypercapnia), nitrogen narcosis (known as “rapture of the deep”), and oxygen toxicity (SCUBA Guide 2007). Physical and health hazards include dangerous marine life (e.g., jellyfish and sharks), dehydration, hypothermia, drowning, running out of air, or underwater emergencies (SCUBA Guide 2007). While SCUBA diving accidents do happen on occasion in Hawai‘i, seldom do the accidents result in fatalities.

The waters off the Island of Hawai‘i are second lowest out of the five main Hawaiian Islands in recorded shark incidents since 1990 (DAR 2007). To minimize risks to the divers, a plan to manage any interactions with sharks will be developed in consultation with appropriate State and Federal agencies.

Emergency services and facilities in the local area will be described in the Draft EIS. In addition, the Hawaii State Division of Boating and Ocean Recreation (DOBOR) requirements for vessel safety requires that all vessels that operate more than one mile offshore must have an Electronic Position Indicating Radio Beacon (EPIRB) or Very High Frequency (VHF) radio on board. There are also specific reporting requirements for any diving injuries, shark incidents or other nautical emergencies that will be followed in the operations of the open ocean aquaculture project.

Environmental Consequences Impact Methodology

In evaluating the possible effects on emergency services and human health and safety within the region of influence, the protocols of DOBOR and the USCG will be reviewed, as well as SCUBA safety and the risk of shark incidents. Factors that will be considered in determining

whether the proposed action would have a significant impact on emergency services and human health and safety include whether this action would result in any of the following:

- Substantial effect on emergency services or public health and safety;
- Conflict with DOBOR, OSHA, or USCG protocols, specifically health and safety protections;
- Pose a potential danger or harm to any Hawaii Oceanic Technology employees, visitors or the general public; and
- Further reduce the capabilities of the USCG or other emergency services in responding to emergency calls.

Factors Considered for Impacts Analysis

Factors that will be considered in determining whether an alternative would have a significant impact on emergency management included the extent or degree to which its implementation would result in the following:

- Change any existing police, fire, or emergency medical services; or
- Require any new police, fire, or emergency medical services.

Potential Impacts and Mitigation Measures

Since all Hawaii Oceanic Technology employees working at the Oceansphere platforms will be trained, certified, and experienced as appropriate to their tasks, and a health and safety plan will be developed and followed for all open ocean activities, the risk of injury will be minimized. Therefore it is anticipated that the proposed operation does not appear to add a significant additional strain on existing emergency services given the substantial amount of recreation and other commercial activities that already occur in the region of influence.

In case an Oceansphere platform becomes inoperative while it is deployed, Hawaii Oceanic Technology will contract with a salvage company that can provide 24/7 emergency response. A sea anchor will be deployed to slow its movement away from the designated station. Onboard monitors will send a signal to the monitoring station that a problem has occurred and the salvage crew will be deployed. Subsurface currents diverge from land margins therefore, these platforms will tend to stay offshore if left adrift rather than come to nearshore waters (Cliff Goudy, 2006, *personal communication w/ Paul Troy*). Since they will be equipped with U.S. Coast Guard approved lighting and marker buoys, these platforms will be noticeable to mariners and not present a hazard to navigation.

The submerged position of the platforms will make them somewhat invulnerable to severe weather; however the effect of a tsunami is hard to anticipate. To the extent there is sufficient warning, the platforms will be evacuated and removed from the danger zone if possible.

However, even with all safety precautions exercised, there is always the possibility of an incident. Based on this preliminary analysis, it is anticipated that the proposed action will cause a less than significant impact on emergency services, health and safety.

2.11 Cultural and Archeological Resources

Cultural resources in Hawai‘i consist of Native Hawaiian traditional resources and historic properties (“historic properties” in federal preservation language is used for sites that are eligible for nomination to the National Register of Historic Places [NRHP]). These include prehistoric and historic (post-Contact, post-CE 1778) archaeological resources, historic architectural properties, cultural items, sacred sites, and collections subject to protection under the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order 13007, and the guidelines on Curation of Federally Owned and Administered Collections (36 CFR Part 79).

The region of influence for cultural resources includes all harbor structures and facilities utilized by the open ocean aquaculture operation and the proposed leased ocean areas for the proposed action. In addition to this region of influence, the cultural history of the land on the shore adjacent to the Proposed Action site in North Kohala known as Pu‘u Ulaula is being researched to identify patterns of cultural activity, and native Hawaiian families and other kama‘aina with historical associations with the land and adjacent sea are being identified.

Impact Assessment Methodology

The methods for assessing potential impacts to cultural resources include identifying significant cultural resources in the areas of potential effect under the proposed action and determining potential direct and indirect impacts on these resources.

Maps and other documents will be examined to determine the locations of the project areas of potential effect. Historical and current maps and photographs, cultural resources reports, and archival records will be reviewed to identify cultural resources in the areas of potential effect. Federal, state, and local inventories of historic (i.e., significant) places, including the National Register of Historic Places, will be reviewed for information related to prehistoric and historical (pre- and post-Contact) resources considered eligible for the National Register of Historic Places (NRHP).

A cultural impact assessment study is being prepared using the Guidelines for Assessing Cultural Impacts adopted by the Hawaii Environmental Council in 1997 (OEQC 1997) to ensure compliance with Chapter 343, Hawaii Revised Statutes. This includes first identifying those people who are familiar with the cultural practices and features associated with the project area, then arranging for interviews with each individual. The interviews include a request for describing their family genealogy history and their relation to the land; about stories and times they associate with the land, historical and cultural resources, practices and values associated with the project site and surrounding sea and land; any memories they have of the land and the

ocean in the area; any cultural values they associate with the land or ocean in the area. The interviews also include asking for the interviewee's perspective on the potential impact on cultural resources, practices, values of the proposed project, as well as suggestions for others to consult about this area of land or ocean. Notes and transcripts for each meeting are being prepared and returned to interviewees for review, correction and release as part of the Cultural Impact Assessment. This Cultural Impact Assessment will be included in the EIS.

Factors Considered for Impacts Analysis

The factors that determine the significance of potential impacts to cultural resources in an APE are determined based on the federal laws and regulations that set the standards for cultural resources protection. An undertaking is considered to have an adverse effect on a historic property when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include, but are not limited to, the following:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property or alteration of the character of the property's setting when that character contributes to the property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property, or changes that may alter its setting;
- Neglect of a property, resulting in its deterioration or destruction; and
- Transfer, lease, or sale of a property without adequate provisions to protect its historic integrity.

Native Hawaiian sites, including sacred sites, burials, and cultural items, whether or not they are considered NRHP-eligible, may also be protected under the American Indian Religious Freedom Act (AIRFA), ARPA, or NAGPRA. Factors considered in determining whether an action would have a significant impact on cultural resources include the extent or degree to which its implementation would result in the following:

- An adverse effect on a historic property or traditional cultural property as defined under Section 106 of the NHPA; or
- A violation of the provisions of AIRFA, ARPA, or NAGPRA.

Public concerns will also be considered as part of this impact analysis. The concerns expressed by the public during previous analyses emphasized the following needs: continuing access to traditional and religious sites for ceremonial purposes and to hunting and gathering areas; protecting and preserving archaeological and traditional sites; interpreting significance based on Native Hawaiian tradition and the knowledge of community elders; and complying with federal and state laws and regulations concerning cultural resources protection.

Research of the NRHP show that there are no historic sites in the proposed ocean lease site. Based on opinions and comments made during interviews with kupuna, cultural practitioners, cultural descendants, and the recognized konohiki of the ahupua'a and surrounding moku, there are no Traditional Cultural Properties in the proposed ocean lease site and the proposed operation

would not affect or impair traditional or customary Native Hawaiian rights and cultural practices. Details of these interviews will be presented in the Environmental Impact Statement.

3. Conformance with Public Plans and Policies

3.1 Relationship to State Statutes, Plans and Policies

3.1.1 Chapter 343 of the Hawaii Revised Statutes

Compliance with environmental requirements mandated in Chapter 343, HRS, is discussed above in Section 1.5

3.1.2 State Land Use Law, Chapter 205, Hawaii Revised Statutes

The State Land Use Law (Chapter 205, HRS) establishes the State Land Use Commission, and gives them the authority to designate all lands in the State as either Urban, Rural, Agricultural or Conservation. State Land Use classification for the Proposed Action ocean lease site is Conservation, in a Resource subzone. This Proposed Action is an identified land use in the Resource Subzone of the Conservation District, pursuant to Section 13-5-4, Hawaii Administrative Rules (HAR), R-1, Aquaculture, D-1: “aquaculture under an approved management plan.” Since this Proposed Action is in the Conservation District, the approving agency is the DLNR Office of Conservation and Coastal Lands, and the project will require a Conservation District Use Permit.

3.1.3 Hawaii State Plan

The Hawaii State Plan establishes a set of goals, objectives and policies that serve as long-range guidelines for the growth and development of the State. The Plan is intended to achieve the following goals:

- A strong, viable economy, characterized by stability, diversity and growth that enable fulfillment of the needs and expectations of Hawaii’s present and future generations.
- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- Physical, social and economic well-being, for individuals and families in Hawaii that nourishes a sense of community responsibility, of caring and participation in community life. (HRS 226-4)

Priority objectives and policies relating to the economy (in general, related to agriculture, and related to potential growth activities), and the physical environment (related to land-based, shoreline and marine resources).

State economic objectives and policies related to the general economy include:

- Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.
- A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.

State economy objectives relating to agriculture include:

- Viability of Hawaii's sugar and pineapple industries.
- Growth and development of diversified agriculture throughout the State.
- An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.

Specific policies associated with agriculture that are relevant to the proposed action include:

- Encourage agriculture by making best use of natural resources.
- Expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.
- Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency.

State economic objectives relating to potential growth activities include:

- Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversity Hawaii's economic base.

Specific policies associated with potential economic growth activities that are relevant to the proposed action include:

- Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.
- Provide public incentives and encourage private initiative to attract new industries that best support Hawaii's social, economic, physical, and environmental objectives.
- Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.

State policies relating to the physical environment with regard to land-based, shoreline and marine resources include:

- Prudent use of Hawaii's land-based, shoreline and marine resources.
- Effective protection of Hawaii's unique and fragile environmental resources.

Specific policies associated with the physical environment of land-based, shoreline and marine resources that are relevant to the proposed action include:

- Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
- Take into account the physical attributes of areas when planning and designing activities and facilities.
- Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

The EIS will include a discussion of these state policies and how the proposed action is consistent with them.

3.1.4 Hawaii State Functional Plans

The State Functional Plans implement the Hawaii State Plan in specific areas of major statewide concern with a definition of strategies for departmental policies, programs and priorities. The EIS will discuss the relevant State Functional Plans related to agriculture.

3.2 County of Hawaii

3.2.1 General Plan

The Hawaii County Council approved the most recent version of the County General Plan in February 2005, and amended it in 2006. Though the proposed ocean lease site is not in the Land Use Planning Allocation Guide map, nor under County jurisdiction, the EIS will discuss the sections of the plan relevant to the proposed action since the land-based operation is in Kawaihae Commercial Harbor, and the region of influence for the proposed action is the County of Hawaii.

3.2.2 Community Development Plan

As part of the General Plan, "community development plans" are to be developed for each judicial district. The North Kohala Community Development Plan is currently under consideration by the County Council. Though the proposed ocean lease site is not under County jurisdiction, it is located offshore the North Kohala coastline. The EIS will discuss the portions of the community development plan that are relevant to this coastline.

3.2.3 County Zoning

The proposed ocean lease site is not under County jurisdiction, therefore has no County zoning. County zoning for the Kawaihae Commercial Harbor is industrial, which is compatible with the proposed land-based operation of the proposed action in the harbor. This will be discussed in the EIS.

3.2.4 Special Management Area

The proposed ocean lease site is not under County jurisdiction, and is not in the Special Management Area (SMA). The Kawaihae Commercial Harbor is in the SMA, and the proposed uses are consistent with the existing approved activities in the harbor. This will be discussed in the EIS.

3.3 Permits Required for Project

A decision on whether to proceed with the proposed action rests on numerous factors, such as schedule, availability of funding, and environmental considerations. In addressing environmental considerations, Hawaii Oceanic Technology is guided by several relevant statutes (and their implementing regulations) and Executive Orders that establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, HRS 343, Clean Air Act, Clean Water Act, Noise Control Act, Endangered Species Act, National Historic Preservation Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, Executive Order 11990 (Protection of Wetlands), Executive Order 12088 (Federal Compliance with Pollution Control Standards), Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), and Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Key provisions of these statutes and Executive Orders are described in more detail the EIS, if necessary to better understand their application.

The permits required for this project include:

- US Army Corps of Engineers: Department of Army Permit under Section 10, Rivers and Harbors Act
- DLNR: State Conservation District Use Permit
- DOH: National Pollution Discharge Elimination System Permit & Zone of Mixing Permit
- DLNR and DOA: Aquaculture License

4. Alternatives to the Proposed Action

Alternative open ocean aquaculture sites offshore Milolii, Keauhou Harbor and Keāhole Point were considered. However, after user surveys, public outreach comments, and infra structure considerations the proposed action was identified the most likely candidate. The user survey and vessel survey have revealed that the proposed ocean lease site experiences limited use by the public, with a low chance of finding a vessel in the proposed ocean lease site during the day. Also, access to Kawaihae Commercial Harbor was a strong determining factor. The EIS will present a more detailed analysis of the Keahole Point site for comparison purposes.

4.1 Alternative 2: Ocean Lease Site off Keahole Point

Figure 8. Alternative Site 2 Keāhole Point.

Map of the alternate Open Ocean Aquaculture Site 2 (green region) and the Humpback Whale Marine Sanctuary (purple region). The aquaculture site is 2.6 nautical miles due west of Keāhole Point. The center of the Ocean Lease Site is $19^{\circ}43'39.00''$ N $156^{\circ}06'30.00''$ W and the water depth is 5,800 feet (Map taken from NOAA HIHWNMS website).

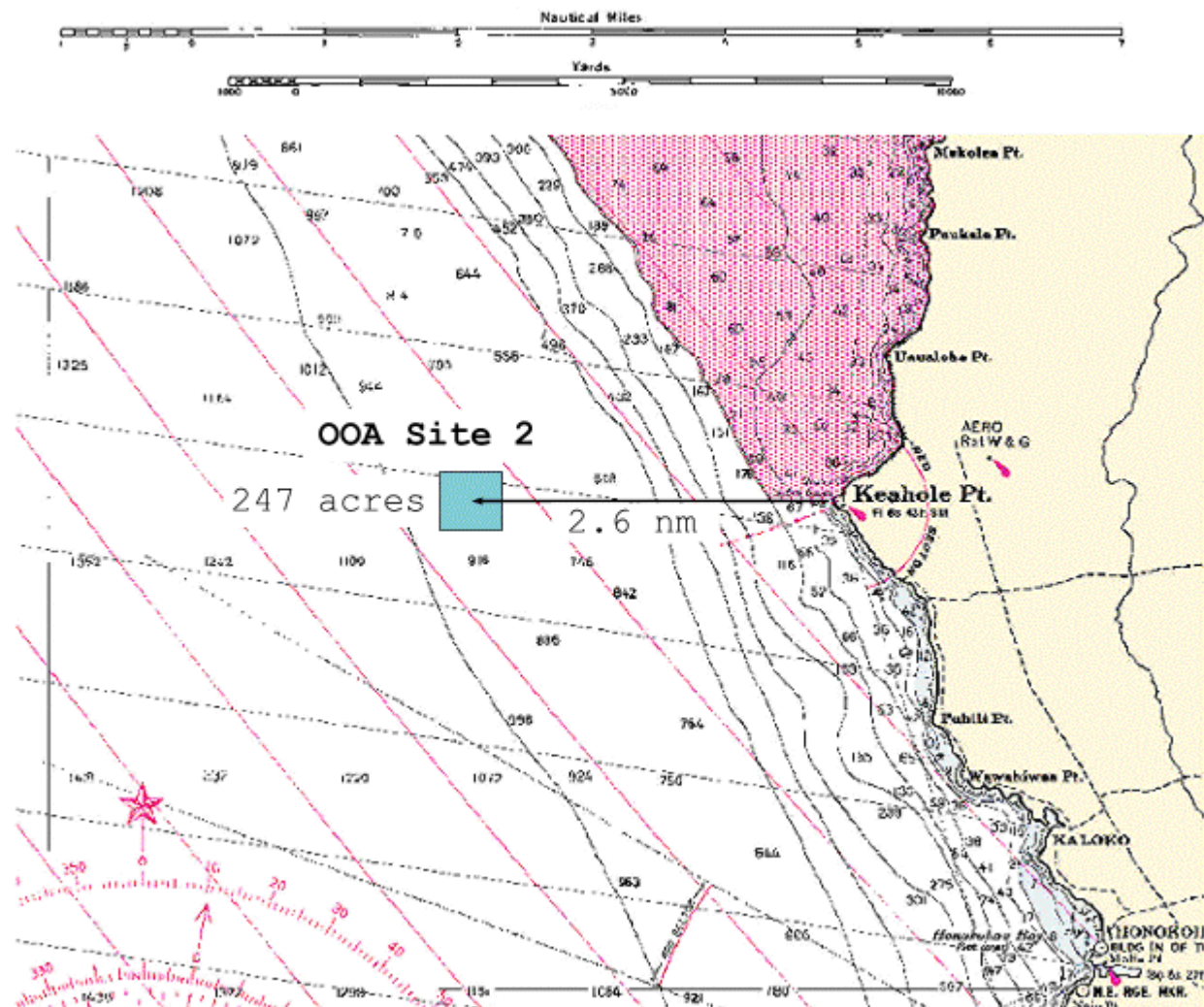
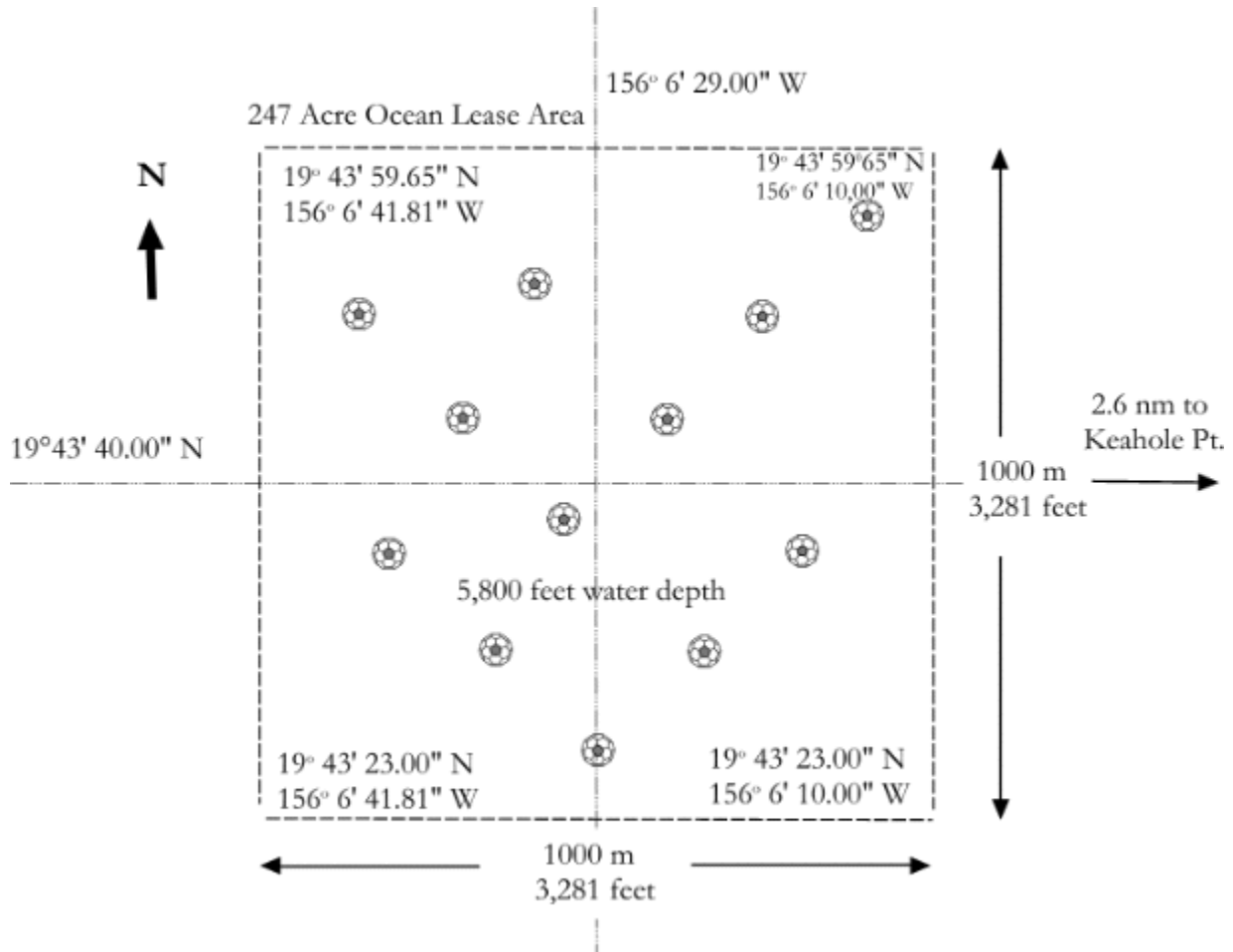


Figure 9. Map of Alternative Site 2.

Lease site is centered at, $19^{\circ} 43' 40.00''$ N $156^{\circ} 06' 29.00''$ W as shown with spacing of twelve platforms within of the ocean lease site to maximize mixing.



The platforms will be evenly distributed in the center of the 247-acre (1.0 square kilometers) site, as shown in Figure 9. Map of lease area centered at $19^{\circ} 43' 40.00''$ N $156^{\circ} 06' 29.00''$ W, with spacing of platforms within the ocean lease site to maximize mixing. The water depth at the site is 5,800 feet (1,768 meter); platforms will be held at a central depth of 154 feet (47 meters) below the water surface and the top will be 65 feet (20 meters) below the ocean surface.

4.2 Alternative 3: No Action Alternative

The final alternative presented in the EIS will be a no action alternative, which would mean the project would not be implemented.

5. Consultation

5.1 List of Agencies and Stakeholders Consulted to Date

Two scoping meeting were held with key government agencies, including Department of Land and Natural Resources (DLNR), Land Division and Division of Aquatic Resources, Department of Business, Economic Development, and Tourism (DBEDT), Office of Planning, Coastal Zone Management (CZM) Program; US Army Corps of Engineers (USACE); National Oceanic and Atmospheric Administration (NOAA) Pacific Island Regional Office (PIRO), and the Hawai‘i State Department of Agriculture, Aquaculture Development Program on September 5, 2006. The purpose of the meetings were to present the Hawaii Oceanic Technology’s proposed project to relevant federal and state regulatory agencies and to receive input and comments on preparing permit applications, environmental documents, and community outreach plans.

Hawaii Oceanic Technology conducted additional meetings with DLNR, Hawai‘i Department of Health (HDOH), and Hawai‘i Department of Agriculture in February 2007 regarding requirements for Conservation District Use Applications (CDUAs) and National Pollution Discharge Elimination System (NPDES) permits and ocean leases.

After substantial research and analysis of alternatives, the Company convened a second agency scoping meeting on July 16, 2008, to update the participants and seek comment on the preferred alternative for the proposed action, and the environmental analysis. Participating agencies included Department of Land and Natural Resources (DLNR), Land Division and Division of Aquatic Resources, Department of Business, Economic Development, and Tourism (DBEDT), Office of Planning, Coastal Zone Management (CZM) Program; Department of Health, Clean Water Branch; Hawai‘i State Department of Agriculture, Aquaculture Development Program; US Army Corps of Engineers (USACE); National Oceanic and Atmospheric Administration (NOAA) Pacific Island Regional Office (PIRO), and the Western Pacific Regional Fishery Management Council.

Consultations with individual members of the public have taken place including the landowners of the adjacent coastal lands in Kohala, and the kupuna involved in fisheries in the area. These include Monty Richards (Kahua Ranch), Pono von Holt (Ponoholo Ranch), the Ho‘opai ohana (Kahuā and Ponoholo Ranch), Ka‘ike o Ka‘āina (lessee of adjacent ahupua‘a parcel), “Lala” La‘au (‘ōpelu fishermen), Robert Cambra (‘ōpelu fishermen), and Kwanji Fukuyama (troller, and bottom fish fisherman). In addition, the project team met with community organizations including the West Hawaii Fishery Council, the Kawaihae Local Resource Council, the Kona Kohala Chamber of Commerce Committee on Environment and Natural Resources. These organizations included many stakeholders and community members from the area.

Figure 10: AGENCY AND PUBLIC OUTREACH

Organization	Date	Forum
<u>GOVERNMENT AGENCIES</u>		
NOAA, National Marine Fisheries Service	9/5/2006	Informational Meeting*
Hawaiian Island Humpback Whale National Sanctuary	9/5/2006	Informational Meeting
US Coast Guard	9/5 & 9/28/2006	Informational Meeting
US Army Corp of Engineers	9/5 & 11/13/2006	Informational Meeting
Center of Excellence in Research in Ocean Sciences	11/13/2006	Attended Conference and met with Federal Officials
HTDV	3/1/2007	Conference
House of Representatives	9/5/2006	Office Visit
DLNR, Aquatic Resources	9/5/2008	Informational Meeting
DLNR, Land Division	9/5/2006	Informational Meeting
Coastal Zone Management	9/5/2006	Informational Meeting
Senator Bobby Bunda	9/5/2006	Office Visit
Senator Paul, Whalen Hawaii district	1/31/2007	Office Visit
Department of Transportation, Harbors Division, District Manager, Hawaii District	5/10/2007	Office Visit
NOAA, National Marine Fisheries Service	07/16/08	2 nd Informational Meeting*
Hawaiian Island Humpback Whale National Sanctuary	07/16/08	2 nd Informational Meeting
Office of Planning, Hawaii State	07/16/08	2 nd Informational Meeting
US Army Corp of Engineers	07/16/08	2 nd Informational Meeting
Department of Health, Hawaii State	07/16/08	2 nd Informational Meeting
DLNR, Aquatic Resources	07/16/08	2 nd Informational Meeting
DLNR, Land Division	07/16/08	2 nd Informational Meeting
Coastal Zone Management	07/16/08	2 nd Informational Meeting
<u>PUBLIC OUTREACH</u>		
ThinkTech Radio Show (56 min.)	2/28/2006	KIPO Hawaii Public Radio
Oceanic Institute	9/28/2006	Office Visit
United Fishing Agency	11/6/2006	Office Visit
Cates International	11/14/2006	Office Visit
UHM Department of Oceanography/HURL/JIMAR	11/14/2006	Office Visits
Deep Blue Research, LLC	11/20/2006	Office Visit
PACRC University of Hawaii Hilo	11/20/2006	Site Visit
Western Pacific Fishery Management Council	4/23/2007	Public Presentation
Kona-Kohala Chamber of Commerce	6/6/2007	Public Presentation
Kawaihae Local Resource Council	8/3/2008	Public Presentation
UHM Dept. Of Marine Engineering	10/8/2008	Public Presentation
William Akau	6/18/2008	Individual meeting
Pono and Angie Von Holt	6/17/2008	Individual meeting
Kimo, Leina`ala and Bernard Ho`opai	6/28/2008	Individual meeting
Monty Richards	6/30/2008	Individual meeting
Eddie "Lala" La`au	7/3/2008	Individual meeting
Robert Cambra	8/19/2008	Individual meeting
Kwanji Fukuyama	8/19/2008	Individual meeting

* Summaries of the two Informational Meeting are available by writing to Aquaculture Development Program, 1177 Alakea Street #400, Honolulu, Hawaii 96813, info@hawaiiacquaculture.org

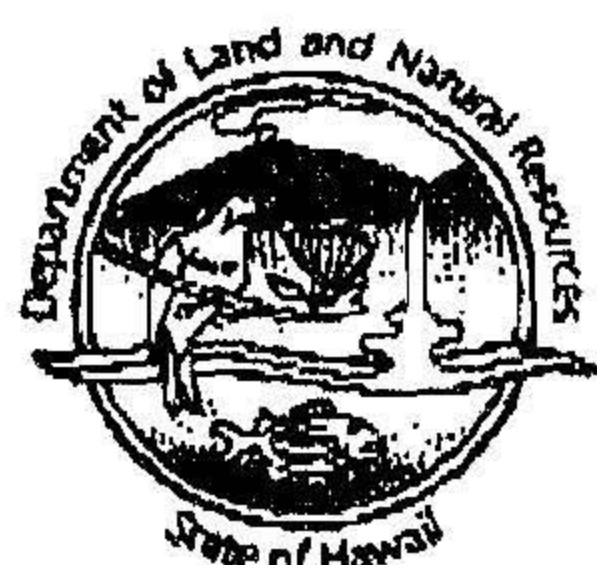
5.2 List of Agencies to be Consulted as Part of the EIS Process

- DLNR, Office of Coastal and Conservation Lands
- DLNR, Land Division;
- DLNR, Division of Aquatic Resources;
- DBEDT, Office of Planning, Hawaii Coastal Zone Management Program;
- DOH, Clean Water Branch;
- Hawai‘i State Department of Agriculture, Aquaculture Development Program.
- US Army Corps of Engineers;
- US Coast Guard
- NOAA Pacific Islands Regional Office of the National Marine Fisheries Service; and
- Western Pacific Regional Fishery Management Council

6. Appendices

6.1 Copy of Letter from Department of Land and Natural Resources, Office of Conservation and Coastal Land of August 8, 2008

LINDA LINGLE
GOVERNOR OF HAWAII



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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENFORCEMENT
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAIHUAWEI ISLAND RESERVE COMMISSION
LAND
PLANTATIONS

REF:OCCL:DH

Corr: HA-09-23

Bill Spencer
Hawaii Oceanic Technology, Inc.
425 South King Street, Suite 2902
Honolulu, Hawaii 96813

AUG - 8 2008

Dear Mr. Spencer,

SUBJECT: Proposed Ahi Aquaculture Project, Offshore Malae Point, North Kohala, Island of Hawaii

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) is in receipt your letter, dated August 4, 2008, regarding the proposed Ahi Aquaculture project, located offshore Malae Point, North Kohala, Island of Hawaii.

The OCCL attended a scoping meeting on July 26, 2008 with other State agencies in which feedback was given regarding the proposed project. You are now asking would the department allow you to proceed with an Environmental Assessment (EA) versus an Environmental Impact Statement (EIS) should you downsize the proposed project.

The OCCL notes instead of proposing a 300 acre aquaculture farm with 12 sea cages (oceanspheres), at a depth of 180 feet (55 meters) to produce 12,000 tons (10,886 metric tons) of yellow fin (*Thunnus albacares*) tuna or bigeye tuna (*Thunnus obesus*) per year, that you downsize the proposed acreage and number of cages. The OCCL notes because the technology and type of cage being proposed is untested, more issues and problems may occur than anticipated; having a smaller number of cages/oceansphere will enable you to address these issues more effectively. Although it is clearly within your rights to submit the application with a Draft EA, the OCCL still recommends you prepare an EIS due to the scope and magnitude of the proposed project.

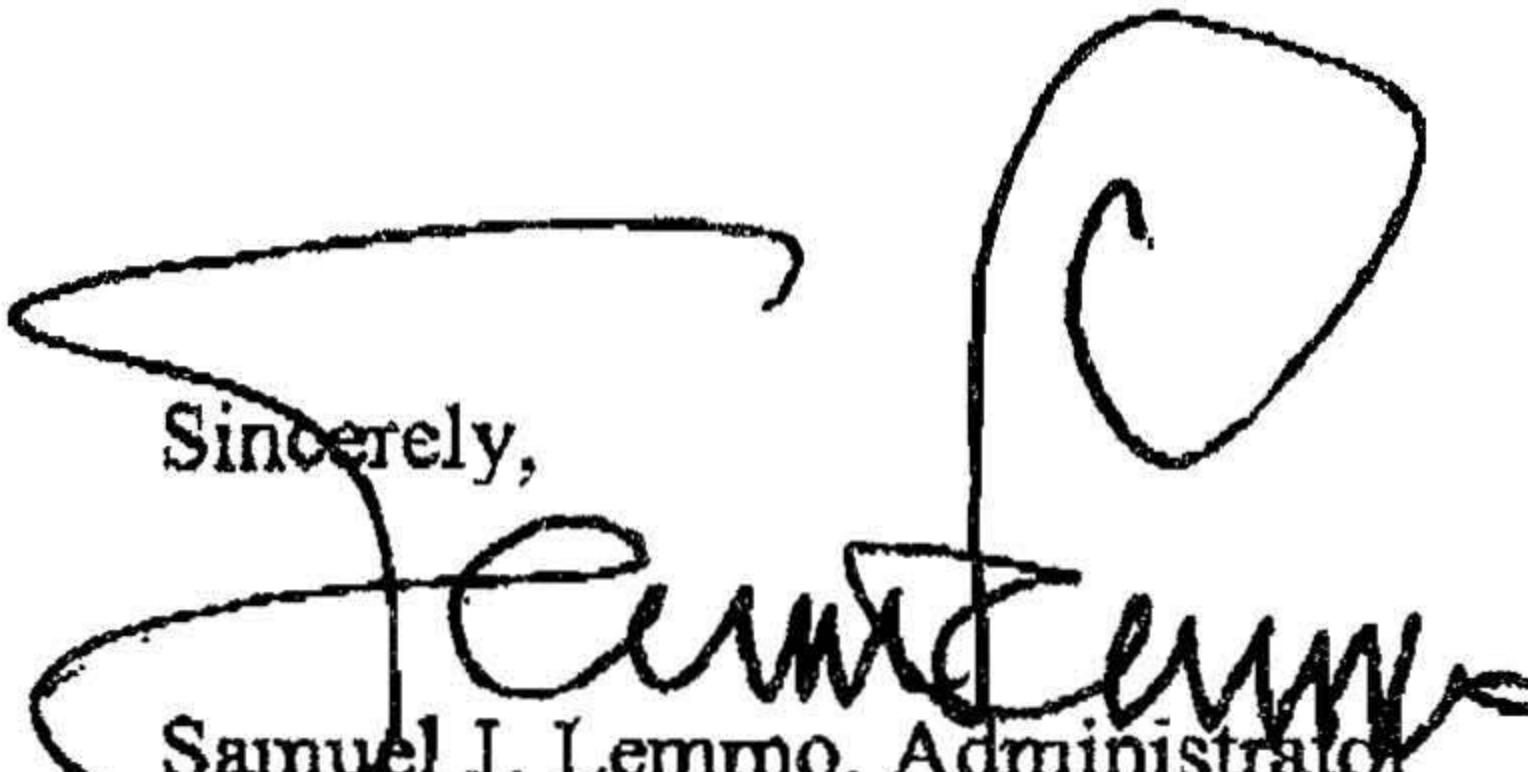
The OCCL would like to remind you that pursuant to Section 190D-11(e) HRS, the Board of Land and Natural Resources (BLNR) shall not approve an application unless it finds that: 1) the applicant has the capacity to carry out the entire project; and 2) whether the proposed project is clearly in the public interest upon consideration of the overall economic, social, and environmental impacts.

REF:OCCL:DH

Correspondence: HA-09-23

Should you have any questions regarding this letter please call Dawn Hegger of the OCCL staff at 587-0380.

Sincerely,



Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

c: Chairperson
Hawaii County Planning Department
Hawaii District Land Office
HLEWNMS – Jeff Walters
CZM – John Nakagawa
DOA- Aquaculture Program

6.2 List of Consultants

Name	Role	Degree/School	Years of Experience
Hawaii Oceanic Technology, Inc. 425 South Street, Suite 2902 Honolulu, Hawai'i 96813			
Paul Troy Chief Technology Director	Technical Editor	PhD, Oceanography, University of Hawai'i Mānoa Graduate Ocean Policy Certificate (MOP), University of Hawai'i Mānoa BS Chemistry, SUNY of Albany	13
Tetra Tech 737 Bishop Street, Suite 3020 Honolulu, HI 96813			
George Redpath	Project Manager	MS, Ecology, University of California, Davis BS, Fish and Wildlife Biology, UC Davis	33
Stephanie Austin	QA/QC	MS, Geology, Texas Tech University BS, Chemistry, Wayland Baptist University	2
Susan Carstenn	Geology, Land Use, Air Quality	PhD, Environmental Science, University of Florida	7
Kitty Courtney	Water Quality, Biological Resources	PhD, Oceanography MS, Biology BA, Biology	25
Rima Ghannam	Socioeconomics	MS, Environmental Management, Swiss Federal Institute of Technology BS, Agriculture, American University of Beirut	10
Landin Johnson	Geology, Traffic, Health and Safety,	BA, Economics, University of Hawai'i	3
Kevin Kelly	Water Quality, Biological Resources	MS, Biological Oceanography BS, Biology	13
Dawn Lleces	Cultural Resources, Land Use, Air Quality	BA, Environmental Sciences, University of Hawai'i	6
Ann Zoidis	Biological Resources	MS, Physiology and Behavioral Biology, San Francisco State University BS, Geology, Smith College	17
Amy Cordle	Technical Editor	BS, Civil Engineering, Virginia Polytechnic Institute and State University	13
Cindy Schad	Word Processor	BFA, Creative Writing, Emerson College, Boston, MA	16
Yashekia Evans	GIS/Graphics	GIS Technician	6
Marine & Coastal Solutions Int'l, Inc P.O. Box 6882 Kamuela, HI 96743			
David Tarnas	Environmental Planning, Community Outreach, Cultural Resources	M.M.A. (Master of Marine Affairs), University of Washington, WA.	22

Name	Role	Degree/School	Years of Experience
Ocean & Air Global Experts 3138 Wailae Avenue, Suite 427, Honolulu, Hawaii 96816			
Roger Lukas	Professor of Physical Oceanography	PhD, Oceanography, University of Hawaii., Manoa	27

6.3 References

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