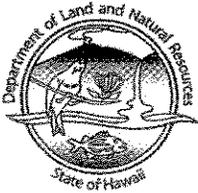


LINDA LINGLE
GOVERNOR OF HAWAII



JUL 23

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

Office of Conservation and Coastal Lands
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL:DH

File No.: HA-3495

MEMORANDUM

TO: Ms. Katherine Kealoha, Director
Office of Environmental Quality Control

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

JUL - 7 2009

A large, stylized handwritten signature in black ink, appearing to read "Samuel J. Lemmo".

SUBJECT: Acceptance of Final Environmental Impact Statement for the Hawaii Oceanic Technology Ahi Aquaculture Project, Offshore Waters of Malae Point, North Kohala, Island of Hawaii

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands Office is submitting the FEIS for the proposed Hawaii Oceanic Technology, Inc. project for publication. The DLNR has determined that this Final Environmental Impact Statement is acceptable under the provisions and guidelines of Chapter 343, HRS and Title 11, Chapter 200, HAR. Please publish notice of availability for this project in the July 23, 2009 issue of the Environmental Notice. The applicant has agreed to provide the hard copies of the FEIS to your office. The applicant will submit an electronic copy of the project summary and the OEQC Bulletin Publication Form.

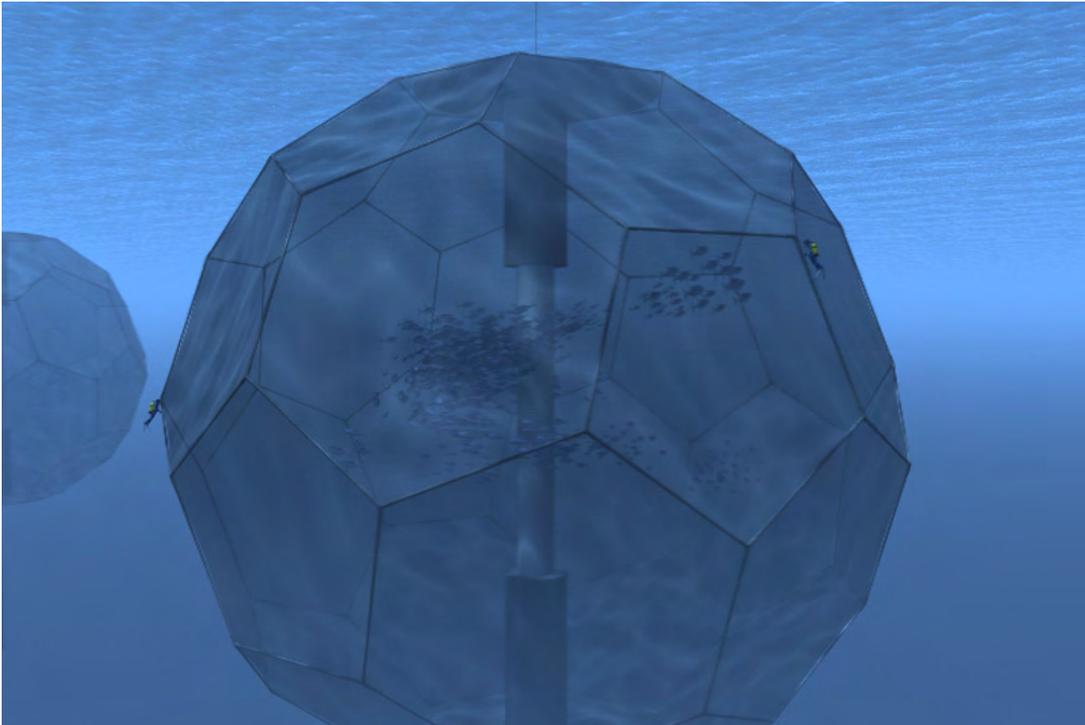
However, the OCCL notes there are still unresolved issue regarding the level of environmental and project disclosure, analysis regarding the engineering design of the proposed engine, fish feed components, lack of benthic studies in the project area, and lack of shark, marine mammal, and endangered species plans.

Should you have any questions please contact Dawn Hegger of the Office of Conservation and Coastal Lands at 587-0380.

FinalDraft Environmental Impact Statement

for the

AHI AQUACULTURE PROJECT KOHALA COAST, HAWAII



May 25, 2009~~December 29, 2008~~

Prepared for:

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813
(808) 225-3579

Prepared by:

Tetra Tech, Inc.
737 Bishop Street, Suite 3020
Honolulu, HI 96813
(808) 533-3366

DESCRIPTION OF ACTION

Hawaii Oceanic Technology proposes to culture yellowfin and bigeye tuna using a closed loop aquaculture process, in which the fingerlings are grown from hatchery spawn of captured broodstock. The company proposes to grow out the tuna to market size in offshore submerged cages, segregated by species, that are self-powered un-tethered 54m-diameter “Oceanspheres.” The proposed ocean lease site is a one square kilometer (247-acre) site, 1,320-foot deep, located 2.6 nautical-miles offshore Malae Point, North Kohala. Twelve Oceanspheres will be deployed incrementally over four years, culminating with an annual production capacity of 6,000 tons.

Fingerlings will be grown in land-based tanks at the Pacific Aquaculture and Coastal Resource Center in Hilo and/ or a future Natural Energy Laboratory Hawaii Authority tuna hatchery in Kona from eggs collected from locally-caught broodstock. About seven additional ahi would be caught each year in local waters to freshen the gene pool of the captured broodstock. The 12-inch, 5-pound fingerlings will be transferred by vessel to the Oceanspheres, and grown to 100-pound harvest size using dry fish feed through automated feed dispensers.

The land base for operations and maintenance equipment, vessels, and staff will be Kawaihae Commercial Harbor. Tuna will be harvested at sea for transshipping through Kawaihae or Hilo Harbor to existing processing and packaging vendors for air-freight to US mainland, Japan, and Hawaii markets.

Significant Beneficial and Adverse Effects

The direct beneficial effects of the proposed action are added revenue to the local economy; tuna processing, boat operators and shipping industries. Positive effects also include relieving anthropogenic pressure on dangerously overexploited species of tunas and a new sustainable supply of fresh tuna for the local population.

Proposed Mitigation Measures

Project design without anchors or loose nets, located in 1,320-foot deep waters, 2.6- nm from shore will mitigate potential adverse impacts on water quality, biological, cultural, recreational and visual resources. On-going water quality monitoring, and management plans for marine mammals, sea turtles, and sharks will ensure regulatory compliance. Additional mitigation measures will be developed during project planning and incorporated into design and construction.

Environmental impacts are mitigated through proper biology and wildlife best management practices. Marine Mammal Management Plan, Shark Management Plan, Endangered Species Management Plan and Emergency Management Plan will be developed with US-NMFS and DLNR-DAR and be on the worksite and available for inspection.

Alternatives Considered

Alternate actions considered in this ~~E~~DEIS include the Alternative 2 site for open ocean aquaculture, located 2.6 nm offshore Keahole Point, and Alternative 3: no action.

Unresolved Issues

There are no unresolved issues that have not been addressed in the ~~E~~DEIS. There are pending permits and approvals.

Compatibility with Land Use Plans and Policies

Aquaculture operation is consistent land use with the State Plan, the Agriculture Functional Plan, and the Conservation Lands Functional Plan. It is a permissible use of this Resource Subzone of Conservation land. The land base for operations is in Kawaihae Commercial Harbor for either the Proposed Action site, or the Alternative 2 site. This will be on leased land at Kawaihae Commercial Harbor. All proposed land uses at the base are commercial operations and are consistent with Kawaihae Commercial Harbor requirements. The Region of Influence (ROI) for the entire operation is the project's proposed ocean lease area itself, as well as the leased land at Kawaihae Commercial Harbor.

Listing of Permits or Approvals

The permits required for this project include:

1. US Army Corps of Engineers: Department of Army Permit under Section 10 of the Rivers and Harbors Act
2. US Coast Guard: Special Use Permit
3. DLNR/OCCL: State Conservation District Use Permit
4. DOH: National Pollution Discharge Elimination System Permit & Zone of Mixing Permit
5. DLNR/DOA: Aquaculture License
6. DBEDT – Office of Planning, Hawaii Coastal Zone Management Program: Federal Consistency Determination
7. County of Hawaii: SMA permit and building permit if the company is unable to lease an existing building and must make improvements to an undeveloped lot at Kawaihae Harbor for land base of operations.

Table A: Summary of issues or concerns about the Hawaii Oceanic Technology Ahi Aquaculture project that were identified by State, Federal and County government agencies at meetings from 2006-2009:

Issue or concern from government agency (1,2,3,4)*	Impact Analysis, Determination, Monitoring and Mitigation	Page # in FEIS
<u>Because of scope and magnitude of the proposed operation, HOT should do an EIS, not an EA (2,3)</u>	<u>While it would make them the first open ocean aquaculture company required to go through an EIS, Hawaii Oceanic Technology decided to prepare an EIS, instead of an EA</u>	<u>1-4</u>
<u>Need to do a cultural impact assessment (2,3)</u>	<u>HOT chose to do an extensive Cultural Impact Assessment for the EIS, which follows the OEQC Guidelines for Assessing Cultural Impacts</u>	<u>Appendix C & 2-105–2-131</u>
<u>This is the largest aquaculture operation proposed yet. It is new and unproven technology. Navigation, propulsion and communication systems, as well as structural integrity need to be tested. HOT should build a smaller version first and test it without fish first. Then, based on successful performance allow to start with a limited number of Oceanspheres. (2,3,4)</u>	<u>The technology to be deployed has been proven in naval and oil industry applications and is definitely not unproven or untested. Since its use in open ocean aquaculture is new, the development plan is to do a phased deployment of the Oceansphere. This would include an initial smaller version of the Oceansphere that is 44-m diameter, to test the components, its seaworthiness, and work out any challenges. Depending on engineering analysis, the following additional Oceanspheres would be 55-m diameter versions.</u>	<u>1-4, 1-5, 1-9, 1-13, 1-21, 2-42</u>
<u>If the closed cycle hatchery doesn't work, will you do a catch and fatten operation for ahi? (4)</u>	<u>No. This proposed project is specifically based on hatchery produced fingerlings from locally caught ahi broodstock.</u>	<u>1-13</u>
<u>What will happen if the propulsion system fails? (2,3,4)</u>	<u>The Oceansphere contains backup telemetry systems and remote control capabilities such that a total system failure is unlikely. In that unlikely event, a required transponder will signal the Coast Guard and battery powered transmitters will alert shore staff. If necessary a sea anchor will be automatically deployed to slow its movement. Onboard monitors will send a signal to the monitoring station, and a salvage crew (on call 24/7) will be deployed. Analysis indicates that the Oceansphere would not come ashore, but rather move NW and pass hundreds of miles south of Oahu. It is anticipated that any Oceansphere would be recovered within a few hours of failure.</u>	<u>1-14 – 1-20</u>

<p><u>How will this project affect wild fisheries? (1,2,3,4)</u></p>	<p><u>The only two longtime ‘opelu fishermen who have used this general coastal ocean area for many decades were interviewed. Both agreed that the fishing ko‘a for ‘opelu do not exist in the project area. Two longtime bottom fishermen noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.</u></p> <p><u>There was agreement among fishermen that there will be less than significant impacts from the project on near shore fish because of the distance of the proposed site to the nearest reef, opelu ko‘a, and ono trolling lane (over 2 miles). While there was concern among some bottom fishermen about adverse impacts to bottom fish, protocols will minimize excess feed, and the great depth of water (1,320’) ensures that nothing would reach the benthic bottom fish habitat. Since the site is about one mile from and 400’ deeper than the bottom fish grounds (about one mile), no significant impact is anticipated.</u></p>	<p><u>2-63, 2-64, 2-132, 2-136</u></p>
<p><u>How many broodstock will you catch? (1,2,3,4)</u></p>	<p><u>About seven per year.</u></p>	<p><u>1-1, 1-13</u></p>
<p><u>Is fishing allowed around the farm? (2,3,4)</u></p>	<p><u>Yes, fishing is allowed in the open ocean lease are except above or below the Oceansphere. Boaters are asked to remain further than 100’ from each buoy marking each Oceansphere as a safety precaution.</u></p>	<p><u>1-21</u></p>
<p><u>Project must meet criteria water quality protection in the State’s “antidegradation policy, designated uses, and water quality. NPDES required. (1,2,3,4)</u></p>	<p><u>Strong currents in the open ocean provide rapid assimilation. ZOM analysis determined that no impact on water quality outside ZOM. NPDES required, water quality monitoring requ’d</u></p>	<p><u>2-32 – 2-44</u></p>
<p><u>Because of concern about deterioration of water quality around the ahi aquaculture operation, an independent water quality monitoring should be done as part of NPDES. (4)</u></p>	<p><u>Strong currents in the open ocean provide rapid assimilation. ZOM analysis determined that no impact on water quality outside ZOM. NPDES required, water quality monitoring requ’d</u></p>	<p><u>2-32 – 2-44</u></p>
<p><u>Accumulation of fish waste on the bottom and affects on</u></p>	<p><u>Great depth (1,320 feet), and strong currents will allow for rapid mixing and assimilation of</u></p>	<p><u>2-23, 2-42</u></p>

<p><u>benthic environment. (1,2,3,4)</u></p>	<p><u>the fish waste. In addition to mixing, there are biological processes that take up the waste as it sinks such that no fish waste is anticipated to reach the bottom.</u></p>	
<p><u>Accumulation of excess fish feed under the Oceansphere and effects on attracting fish and sharks and marine mammals. (1,2,3,4)</u></p>	<p><u>Careful feeding protocols and monitoring efficiencies will minimize any excess feed. This will minimize any attraction to other fish, sharks or marine mammals from excess fish feed. In addition, the site's great depth (1,320 feet), and strong currents will allow for rapid mixing and assimilation of any excess feed.</u></p>	<p><u>2-42</u></p>
<p><u>How will you handle disease? Should also use ADP Disease Management Program. (2,3,4)</u></p>	<p><u>Hawaii Institute of Marine Biology will determine disease diagnosis and management. In addition, HOT would consult with the Hawaii ADP Disease Management Program</u></p>	<p><u>1-20, 2-11</u></p>
<p><u>Need to provide detailed analysis of currents in the area (2,3)</u></p>	<p><u>To provide the additional information on currents in the proposed ocean lease area, HOT had an additional study completed on currents in this area done by a local expert. This is included in the FEIS.</u></p>	<p><u>2-36 – 2-43, Appendix B</u></p>
<p><u>Marine mammals might get entangled in the mesh or the tether of the Oceansphere. (1,2,4)</u></p>	<p><u>The design is specifically to minimize entanglement risk in the mesh, as well as the tether. HOT plans to use hardened Dyneema® or Kikkonet rigid plastic net pen mesh, which represents no entanglement threat to marine mammals. The tether to the surface buoy is held taut by the Oceansphere and current and would not present any entanglement risk</u></p>	<p><u>2-11, 2-64, 2-66, 2-72</u></p>
<p><u>Additional cetacean species should be included in the DEIS. (4)</u></p>	<p><u>These additional cetacean species are listed in the FEIS, and the potential impact on whales, and the different delphinid species are analyzed. The design of the Oceansphere produces low levels of underwater noise impacts, minimizes entanglement risk and unintentional provisioning, and therefore significantly reduces the attractants to these species in order to minimize any impact on these species.</u></p>	<p><u>2-50 – 2-52, 2-55 – 2-59, 2-66 – 2-70</u></p>
<p><u>Marine mammals might experience some adverse impact from noise from the Oceansphere and the aquaculture operations. You need a marine mammal monitoring plan. (2,4)</u></p>	<p><u>The noise from the thrusters is below the level of noise that would cause harassment or any adverse impact on marine mammals. A marine mammal monitoring plan will be developed with DAR and NMFS to meet their requirements.</u></p>	<p><u>2-55 – 2-59</u></p>

<p><u>Dolphins and monk seals might change their feeding behavior because of unintentional provisioning due to fish escapes. (1,2,4)</u></p>	<p><u>Technology design of the Oceanspheres have substantially minimized the potential for fish escapes. By preventing these fish escapes, the potential for unintentional provisioning of marine mammals would not occur. This would reduce the attractiveness of the Oceansphere to marine mammals. Careful marine mammal monitoring will ensure compliance with federal and state law. Ongoing consultation will continue with NMFS.</u></p>	<p><u>2-11, 2-66 – 2-70</u></p>
<p><u>We disagree that there assertion that all outcomes on marine mammals are unknown and therefore the impacts will be less than significant. Kona Blue Water Farms experience shows an increase number in bottlenose dolphins visiting their site regularly. You should use the KBWF data and infer similar impacts for your operation. (4)</u></p>	<p><u>Additional information on marine mammals from the Kona Blue Water Farm Final Supplemental EA was included in the FEIS. The unique design of the Oceansphere has minimized any potential for escapes, minimized the potential for unintentional provisioning of the animals, all of which will significantly reduce the attractiveness of the Oceanspheres to bottlenose dolphins. Nonetheless, the monitoring protocols required by NMFS will be required.</u></p>	<p><u>2-11, 2-66 – 2-70</u></p>
<p><u>Sharks would be attracted to the Oceansphere and might increase predation on marine mammals. You need to develop a shark safety plan. (1,2,3,4)</u></p>	<p><u>HOT recognizes that sharks are an important cultural resource. The company’s BMP goal is to avoid predator interactions by denying them a food source by the use of impenetrable cages and netting materials, video monitoring of feedings, and a wildlife monitoring and reporting system to meet DAR/DLNR protocol.</u></p> <p><u>Kona Blue has recorded only rare instances of tiger sharks around its existing farm; probably related to seasonal migrations. Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh. A shark safety plan is presented in the FEIS.</u></p>	<p><u>2-48 – 2-49, 2-70 – 2-72</u></p>
<p><u>How will this project affect the local economy and the livelihood of local fishermen? (1,2,4)</u></p>	<p><u>This project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi will be sold in the local market. But, the target market for the ahi is the US domestic market, especially</u></p>	<p><u>2-98 – 2-99</u></p>

	<p><u>the west coast, as well as Japan because of the higher price the product will obtain. This will generate revenue as taxable export revenues to the State. 80% of the tuna consumed in Hawaii is imported. HOT intends to supply no more than 10% of the local market. Thus, the company does not anticipate any adverse impact on the local fisherman.</u></p>	
<p><u>Consider cumulative impacts (3)</u></p>	<p><u>The analysis of cumulative impacts was expanded and included in the DEIS and FEIS.</u></p>	<p><u>2-4 – 2-15</u></p>
<p><u>What is composition and source of fish feed pellets? Concerned about source of fish meal and sustainability of bait fish fishery. (1,2,3,4)</u></p>	<p><u>The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing, and will produce our feed to our exacting specifications. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. As stated in the EIS, Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources.</u></p>	<p><u>1-17 – 1-18</u></p>
<p><u>Fish processing wastes are a resource that could be used for cattle feed. (4)</u></p>	<p><u>HOT agrees and started to work to connect the fish processors with local ranches interested in using fish processing wastes as cattle feed.</u></p>	<p><u>1-21</u></p>
<p><u>Will there be processing on board the harvest vessel? If so, it needs to be certified.(2,4)</u></p>	<p><u>There will be no processing on board the harvest vessel. The fish will be processed on shore at existing fish processing facilities.</u></p>	<p><u>1-21</u></p>
<p><u>How will fuel spills be handled? (3,4)</u></p>	<p><u>All vessels used will be Coast Guard approved. Any fuel spills will follow standard response for cleanup and notification.</u></p>	<p><u>2-69</u></p>
<p><u>Kawaihae Harbor berths and operational areas are already congested, so any future land base for HOT will need to be added in the Harbor Master</u></p>	<p><u>After consultation with DOT Harbors, HOT participated in the stakeholders’ meeting with the Kawaihae Commercial Harbor 2035 Master Plan with DOT-Harbors, consultation will continue.</u></p>	<p><u>2-85 – 2-86</u></p>

<u>Plan. (4)</u>		
<u>In Kawaihae Commercial Harbor, if there are any improvements on undeveloped lease land, it would require an SMA permit and building permit from Hawaii County (4)</u>	<u>The first choice for the company will be to lease an existing building in the Kawaihae Commercial Harbor. However, if that is not available, and improvements need to be made on undeveloped land, then a County SMA permit and building permit would be required.</u>	<u>1-2, 1-5, 1-27, 3-10</u>
<u>Submission of a County Solid Waste Management Plan will be required for this project. (4)</u>	<u>HOT will prepare and submit the County Solid Waste Management Plan as required.</u>	<u>2-77</u>
<u>Because federal permit is required, a Hawaii Coastal Zone Management federal consistency review and determination will need to be done. (4)</u>	<u>The FEIS is consistent with State and Federal laws and policies. HOT will work with the Hawaii CZM program to provide information in their Hawaii CZM federal consistency review and determination.</u>	<u>ii, 1-27, 3-10</u>
<u>How will you secure the Oceanspheres from vandalism and burglary? (2,4)</u>	<u>The Oceansphere will be submerged so the top of the sphere is at least 20m (65') below the surface. The buoy will be a secure hardened design to prevent any tampering or vandalism. In addition, cameras, Coast Guard transponder and warning signals and lights will also be used. If any tampering is detected, a signal is sent to the HOT representative and a boat is dispatched immediately to address the situation.</u>	<u>1-9 – 1-21</u>
<u>If a surface cage is to be used, a new environmental review would be needed. (4)</u>	<u>The proposal is to use Oceanspheres, which are submerged most of the time. If a surface cage is used, HOT agrees that a new environmental review would be needed.</u>	

*After each comment, a number is listed which indicates the meeting or correspondence where the comment was made, including:

1. Scoping meeting on September 4, 2006, with Hawaii Oceanic Technology done in cooperation with the Aquaculture Development Program, Hawaii Department of Agriculture, Honolulu, Hawaii.
2. Scoping meeting on July 16, 2008 with Hawaii Oceanic Technology done in cooperation with the Aquaculture Development Program, Hawaii Department of Agriculture, Honolulu, Hawaii.
3. Individual consultation and correspondence with agencies.
4. Individual Agency letters commenting on the DEIS from State and Federal Government Agencies

Table B: Summary of issues or concerns about Hawaii Oceanic Technology, Inc. proposed ahi aquaculture project raised by the public at the different meetings of organizations, individuals, or small groups, and from comment letters from 2007-2009.

<u>Issue or Concern raised by the public (1,2,3,4,5,6) **</u>	<u>Impact Analysis, Determination, Monitoring and Mitigation</u>	<u>Page # in FEIS</u>
<u>The proposed project is so much bigger than any existing project. What is the total annual production? (3,6)</u>	<u>The total annual production is projected to be 6,000 tons per year.</u>	<u>1-4</u>
<u>Concerns that this is new unproven technology. What testing has been done on this technology? (3,6)</u>	<u>Most of Oceansphere technology for telemetry and geostatic positioning has been in use in the US Navy, shipping and in the oil drilling industry for many years. Now we are applying this technology to fish farming. A rigorous course of testing from beta to final version will be done before deploying the full farm capacity so as to deal with unforeseen situations.</u>	<u>1-9 – 1-17</u>
<u>Worried that this project will deteriorate water quality in the surrounding ocean and nearshore waters. Need to do more specific analysis of currents on site. (1,2,3,6)</u>	<u>Strong currents in the open ocean provide rapid assimilation. ZOM analysis determined that no impact on water quality outside ZOM. NPDES required, water quality monitoring will be done.</u>	<u>2-32 – 2-34, Appendix B</u>
<u>Because of concern about accumulation of fish waste on the bottom and affects on benthic environment, benthic monitoring is important. (1,2,3,4,6)</u>	<u>Great depth (1,320 feet), and strong currents will allow for rapid mixing and assimilation of the fish waste. In addition to mixing, there are biological processes that take up the waste as it sinks such that no fish waste is anticipated to reach the bottom. Tuna do not excrete solid fecal matter.</u>	<u>2-23, 2-24, 2-42</u>
<u>Excess fish feed and escaped fish from the Oceansphere will attract fish, which would attract marine mammals, as well as sharks. (1,2,3,4,6)</u>	<u>Careful feeding protocols and monitoring efficiencies will minimize any excess feed. This will minimize any attraction to other fish, sharks or marine mammals from excess fish feed. In addition, the site’s great depth (1,320 feet), and strong currents will allow for rapid mixing and assimilation of any excess feed.</u>	<u>2-42</u>
<u>Ahi aquaculture operations may affect wild fish, conflict with fishing, or adversely</u>	<u>The only two longtime ‘opelu fishermen who have used this general coastal ocean area for many decades were interviewed. Both agreed that the fishing ko‘a for ‘opelu do not exist in the project area. Two longtime bottom</u>	<u>2-62 – 2-63, 2-132 – 2-136</u>

<p><u>affect the bottomfish fishery. What will be the impact on nearshore fisheries, opelu koa, trolling and bottom fish fishing? (1,2,3,4,6)</u></p>	<p><u>fishermen noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.</u></p> <p><u>There was agreement among fishermen that there will be less than significant impacts from the project on near shore fish because of the distance of the proposed site to the nearest reef, opelu ko‘a, and ono trolling lane (over 2 miles). While there was concern among some bottom fishermen about adverse impacts to bottom fish, protocols will minimize excess feed, and the great depth of water (1,320’) ensures that nothing would reach the benthic bottom fish habitat. Since the site is about one mile from and 400’ deeper than the bottom fish grounds (about one mile), no significant impact is anticipated.</u></p>	
<p><u>Will the buoys act as FADs and will this disrupt the opelu koa, trolling lanes and be negative or positive for our fishermen? (1,2,3,4,6)</u></p>	<p><u>It is likely that the Oceanspheres will act as a FAD and are expected to attract carnivorous pelagic fish. The experience with KBWF, and the estimation of the local ‘opelu fishermen was that ‘opelu would probably be attracted to the Oceansphere as they are to other FADs, but the species would be too far from their natural environment and would likely not remain near the platform for any duration. The project may be beneficial as a FAD.</u></p>	<p><u>2-63 – 2-64, 2-134 – 2-134</u></p>
<p><u>Ahi aquaculture operations may conflict with other recreation activity. (1,2,6)</u></p>	<p><u>In the preparation of the DEIS, an extensive vessel monitoring program was carried out to determine what boating or other ocean activity took place within the proposed ocean lease area or nearby. This study showed very little use of the ocean lease site, and only probably for transit purposes. Therefore the proposed project would not conflict with other recreation activities.</u></p>	<p><u>2-27 – 2-30, 2-82 – 2-85</u></p>
<p><u>Concerns about fish escapes and effects on wild fish populations, and attracting dolphins and sharks. (1,2,3,6)</u></p>	<p><u>Technology design of the Oceanspheres has substantially minimized the potential for fish escapes. By preventing these fish escapes, the potential for unintentional provisioning of marine mammals would not occur. This would reduce the attractiveness of the Oceansphere to marine mammals. Careful marine mammal monitoring will ensure compliance with federal and state law. Ongoing consultation will continue with NMFS.</u></p>	<p><u>2-66</u></p>
<p><u>Worried that this will disrupt the migration patterns of whales and</u></p>	<p><u>The proposed ahi aquaculture project does not substantially affect rare, threatened or endangered species or its habitat. The proposed ocean lease site is</u></p>	<p><u>2-60 – 2-61, 2-66 – 2-</u></p>

<p><u>dolphins. This is only a mile away from the whale sanctuary. (1,2,3,6)</u></p>	<p><u>located one mile outside the Hawaiian Islands Humpback Whale National Marine Sanctuary. Technology design minimizes any entanglement risk to marine mammals, reduces risk of fish escapes causing unintentional provisioning of marine mammals, and minimizes any underwater noise impacts on the marine acoustical environment. Monitoring plans for marine mammals and sea turtles, a shark safety plan, and an emergency response plan all will help ensure compliance with State and Federal environmental quality and protected species laws and regulations.</u></p>	<p><u>70</u></p>
<p><u>Will you use underwater sound devices to keep animals away? (6)</u></p>	<p><u>No, Hawaii Oceanic Technology has no intention to use underwater sound devices to keep animals away.</u></p>	<p><u>2-55 – 2-59</u></p>
<p><u>Sharks are very important cultural resources. We don't want them killed. Sharks will be attracted to the Oceanspheres because they'll be FADs and because of fish escapes. That means more sharks will prey on dolphins, steal fish from fishermen, and more will come to shore. What nonlethal means will you use to deter sharks? (1,2,3,4,5,6)</u></p>	<p><u>HOT recognizes that sharks are an important cultural resource. The company's BMP goal is to avoid predator interactions by denying them a food source by the use of impenetrable cages and netting materials, video monitoring of feedings, and a wildlife monitoring and reporting system to meet DAR/DLNR protocol.</u></p> <p><u>Kona Blue has recorded only rare instances of tiger sharks around its existing farm; probably related to seasonal migrations.</u></p> <p><u>Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh. A shark safety plan is presented in the FEIS.</u></p>	<p><u>2-47 – 2-49, 2-66</u></p>
<p><u>When will Shark, Marine Mammal, and Endangered Species Management Plans be available for public review? (6)</u></p>	<p><u>Hawaii Oceanic Technology is committed to working with the federal and state government management agencies to develop these monitoring plans. The public involvement in developing these monitoring plans is a decision to be made by the management agencies. Hawaii Oceanic Technology is committed to raising community awareness of our oceans and plans to provide the observational data resulting from these wildlife monitoring programs and the water quality monitoring programs to the community.</u></p>	<p><u>2-72</u></p>
<p><u>Concerns about the source and composition of fish feed, including the sustainability of the bait fish fishery as source of fish meal, concern if the soy would be GMO, the</u></p>	<p><u>The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications</u></p>	<p><u>1-18</u></p>

<p><u>worry that local opelu would be used for fish meal, and the potential for local fish meal production from cultured fish (1,2,3,6)</u></p>	<p><u>and very transparent about their feed ingredients and processing, and will produce our feed to our exacting specifications. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. As stated in the EIS, Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources.</u></p>	
<p><u>Concerns about impacts on pelagic or benthic environment from pumping up deep cold water for OTEC (3,6)</u></p>	<p><u>The technological design has been modified to remove deep seawater pipe. Nonetheless, pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) was analyzed and found to have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible</u></p>	<p><u>1-9 – 1-15, 2-35, Table 2.4-1a, Table 2.4-1b</u></p>
<p><u>Concerned about overall economic impact on Hawaii and mainland US markets if this product is exported. (6)</u></p>	<p><u>This project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. This will generate revenue as taxable export revenues to the State. 80% of the tuna consumed in Hawaii is imported. HOT intends to supply no more than 10% of its production to the local market. Thus, the company does not anticipate any adverse impact on the local fisherman.</u></p>	<p><u>2-98 – 2-99</u></p>
<p><u>Worried that with a flood of ahi on the market that the price would drop so low, the local ahi fishermen would be adversely affected. (6)</u></p>	<p><u>HOT intends to supply no more than 10% of the local market. Thus, the company does not anticipate any adverse impact on the local fisherman.</u></p>	<p><u>2-98 – 2-99</u></p>
<p><u>Worried that the local recreational and charter boats will suffer because ahi aquaculture will take up space and pollute the waters (6)</u></p>	<p><u>The 247 acres of the proposed ocean lease site is a tiny percentage of the ocean space accessible from Kawaihae Harbor. Pollution impacts are not anticipated to be significant, and would not have impacts on resources affecting local recreational or charter boats. Some comments of charter captains indicated that the operation may increase business.</u></p>	<p><u>2-27 – 2-30, 2-63 – 2-64, 2-82 – 2-85, 2-131 – 2-136,</u></p>

<p><u>Recommend using only first generation for fingerlings. (6)</u></p>	<p><u>The plan is to use broodstock that are caught locally and from their spawn, the fingerlings will be produced from these spawn and grown to a size that can be transferred to the Oceansphere.</u></p>	<p><u>1-13</u></p>
<p><u>Impact of hurricanes and tsunami on Oceanspheres? (1,2,3,6)</u></p>	<p><u>Because Oceanspheres operate in water depths of 1,320' and are is submerged, any tsunami would cause only a small rise in sea level as they pass the area, causing no impact on the Oceansphere. A hurricane would also not cause any impact on the submerged platform. In the event of a hurricane or tsunami, any staff on the Oceansphere would be evacuated and the Oceansphere submerged for the duration of the event.</u></p>	<p><u>2-101 – 2-104</u></p>
<p><u>The ahi aquaculture project's impacts on view plane (3,4,6)</u></p>	<p><u>Based on interviews with the individuals and families who live, work, play, camp, fish and gather in the coastal area adjacent to the proposed ocean lease site, the project will have no significant impact on the view plane from the shoreline. No residential area is located on the adjacent coastal area around Malae Point.</u></p>	<p><u>2-27 – 2-30, 2-134.</u></p>
<p><u>Because of concerns about impacts on cultural resources, the Cultural Impact Assessment is inadequate and needs to include more fishers, and more input from native Hawaiians from the ahupua'a, and the native Hawaiian organizations of the general area, not just the land based rancher families for the adjacent coastal lands. (2,3,4,6)</u></p>	<p><u>The Cultural Impact Assessment includes interviews with long time local fishers and native Hawaiian individuals and groups who are directly related to the specific region of the project. The two leading native Hawaiian kupuna relating to the ocean in this area were interviewed, William Akau and Lala La`au. The native Hawaiians and kamaaina of the ahupua'a and the general Puu Ulaula area were interviewed, including the Ho`opai ohana, a large family of native Hawaiians who have a multi-generational history as paniolo with Kahua Ranch (Pono Von Holt) and Ponoholo Ranch (Monty Richards). Pono Von Holt and Monty Richards were also interviewed since for eighty years, Kahua Ranch (and now Ponoholo Ranch) has held the lease on several thousand acres of government lands and owned the Kiiokalani ahupua'a located on the coastal lands adjacent to the propose ocean lease site. In addition, Michael Hanohano was consulted, as the head of the Hawaiian group, Ka'ike o Ka'aina, which leases a coastal parcel just north of Malae Point. The Cultural Impact Assessment is consistent with the Guidelines for Assessing Cultural Impacts, adopted by the Environmental Council, State of Hawaii, November 19, 1997.</u></p>	<p><u>2-105 – 2-125, Appendix C</u></p>
<p><u>How was it determined that no opelu or other fishing ko'a existed in ocean lease site? (4,6)</u></p>	<p><u>The only two longtime 'opelu fishermen who have used this general coastal ocean area for many decades were interviewed. Both agreed that the fishing ko'a for 'opelu do not exist in the project area. Two longtime bottom</u></p>	<p><u>2-132 – 2-136</u></p>

	<u>fishermen noted that the bottom fishing area only extends out to a depth of 150-160 fathoms, which is about one mile from the site. They all said no one fishes in the proposed ocean lease site.</u>	
<u>How was it determined that no konohiki fishing rights existed in ocean lease site? (6)</u>	<p><u>The two following historical facts were the basis of the determination that there are no konohiki rights in the project area.</u></p> <p><u>According to records of all registered fisheries in the office of the Territorial Surveyor, none were located off Ki'ioikalani ahupua'a, or other ahupua'a in the Pu'u Ulaula region of North Kohala. So, there are no legal konohiki rights or registered fisheries in the area."</u></p> <p><u>The 1839 law passed by King Kamehameha III called "An Act to Regulate Taxes" said that the konohiki, or overseers of ahupua'a...was given the right to regulate fishing in the waters adjoining his ahupua'a "from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach."</u></p>	<u>2-110- 2-121</u>
<u>What ahupua'a is this ocean lease site and was the project area under a Royal Patent? (6)</u>	<u>The proposed ocean lease site is located 2.6 nm SW of Malae Point. Malae Point is a point shared by two ahupua'a, Kiiokalani and Kaihooa. While the project area is not under Royal Patent, the adjacent coastal land area of Kiiokalani ahupua'a was a Land Court Award to Fanny Young, now owned by Kahua Ranch. Kaihooa was government land</u>	<u>2-112 – 2-117.</u>
<u>Is there anything that will inhibit traditional and customary practice by native Hawaiians, or access to cultural resources? (6)</u>	<u>No historic sites, or sites of religious significance are recorded at the proposed ocean lease site. The proposed operation will not have a significant effect on fishing, which is the major cultural activity in the area, as discussed above. In addition, the analysis shows that the operation would not deprive any native Hawaiian of their traditional and customary rights.</u>	<u>2-131 – 2-135</u>
<u>How do you handle fish diseases? (1,2,3,5,6)</u>	<u>Hawaii Institute of Marine Biology will determine disease diagnosis and management. In addition, HOT would consult with the Hawaii ADP Disease Management Program</u>	<u>1-20</u>
<u>What kind of disclosure will there be when a fish disease happens? (1,2,3,6)</u>	<u>HOT would follow the protocol established by HIMB and the ADP Disease Management Program</u>	<u>1-20</u>
<u>Will you use antibiotics, and other drugs? (3,6)</u>	<u>Because the stocking density of the Oceanspheres will be comparatively low, diseases from overcrowding would not be likely. Nonetheless, in the event of a diseased fish being found, HOT would follow the protocol established by HIMB and the ADP Disease Management Program</u>	<u>1-20</u>
<u>How will solid waste</u>	<u>The ocean operations are not expected to generate solid</u>	<u>2-77</u>

<u>from the production operations be disposed of? (6)</u>	<u>waste. The solid waste generated by the office and land base of operations will be disposed of in the local County landfill.</u>	
<u>What measures will be done to protect genetic diversity? (3,6)</u>	<u>The plan is to use broodstock that are caught locally and from their spawn, the fingerlings will be produced.</u>	<u>1-1, 1-13</u>
<u>Where will you sell your fish? (1,2,3,4,5,6)</u>	<u>The plan is to sell some in Hawaii (no more than 10% of the local market), and sell the rest to Japan and US mainland (primarily west coast)</u>	<u>1-21, 2-98 – 2-99</u>
<u>What is carrying capacity in terms of numbers of aquaculture farms along the West Hawaii coast? (2,3,6)</u>	<u>Such a carrying capacity determination is beyond the scope of this EIS. However, the only other existing open ocean aquaculture operation is twenty miles to the south, thus there should be no cumulative impact.</u>	<u>2-8</u>
<u>Would you have lights on the buoys?(1,2,3,4,5,6)</u>	<u>Yes, there will be Coast Guard approved lights, reflectors and other required navigation aids on the buoys.</u>	<u>1-11</u>
<u>What happens when the propulsion system fails on the Oceansphere? Will they come ashore? (1,2,3,4,5,6)</u>	<u>Initially, a sea anchor is automatically deployed to slow its movement. Onboard monitors will send a signal to the monitoring station, and a salvage crew (on call 24/7) will be deployed. Coast Guard will be notified. Analysis indicates that the Oceansphere would not come ashore, but rather move NW and pass hundreds of miles south of Oahu. It is anticipated that any Oceansphere would be recovered within a few hours of failure.</u>	<u>1-14 – 1-20</u>
<u>What’s impact of daily cleaning of Oceanspheres? (6)</u>	<u>The algae that is growing on the Oceanspheres would be eaten by any herbivore fish. This same algae cleaned from the Oceanspheres would be allowed to sink into the marine environment, and would either be eaten by the fish in the area, or be assimilated by other biological processes or dispersion in the deep water and strong currents of the site.</u>	<u>2-63 – 2-63</u>
<u>How will you remove mortalities? (6)</u>	<u>Mortalities will be removed by an underwater remotely operated vehicle.</u>	<u>1-20</u>
<u>Are you processing at sea or on land? (1,2,3,6)</u>	<u>Processing will be done on land at an existing fish processing operation in Kona or Hilo.</u>	<u>1-21</u>
<u>How will you ensure fish processing waste is used for beneficial purposes and not thrown in the dump? (6)</u>	<u>HOT is working with the existing fish processors and local ranchers to arrange a partnership to make beneficial uses of the by-product from the fish processing. No final contracts have been negotiated, yet.</u>	<u>1-21, 2-77</u>
<u>Will the fish be organic? (6)</u>	<u>Hawaii Oceanic Technology will follow the requirements of The National Organics Standards Board (NOSB) in its definition of organic aquaculture. The NOSB is currently working on “Proposed Organic</u>	<u>1-18</u>

	<u>Aquaculture Standards” (most current draft dated September 28, 2008) in which answers to your question are being proposed for consideration by the public and the regulatory agencies. As there are no specific guidelines in place, we will specify to our food suppliers that they use organic sources in their formulation.</u>	
<u>Are these genetically engineered fish? (6)</u>	<u>The plan is to use broodstock that are caught locally and from their spawn, the fingerlings will be produced. The company has no plans to genetically engineer the fish.</u>	<u>1-1, 1-13</u>
<u>What’s the feed to fish growth ratio? (6)</u>	<u>The estimated ratio is 2:1.</u>	<u>1-17</u>
<u>This project is not sustainable because it relies on importing fish feed and exporting the ahi. (6)</u>	<u>This project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. HOT intends to supply no more than 10% of its production to the local market. The target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. This will generate revenue as taxable export revenues to the State. 80% of the tuna consumed in Hawaii is imported.</u>	<u>2-98 – 2-99</u>
<u>The project should be required to post a bond to make sure everything is removed and the environment is returned to original condition in case of a bankruptcy. (6)</u>	<u>The company does not intend to post a bond. The company will abide by the requirements in the Conservation District Use Permit which specifically address the restoration of the ocean lease site to its original condition at the end of the lease.</u>	
<u>Will you be testing the fish for PCBs, heavy metals, mercury? (6)</u>	<u>Once the ahi aquaculture operation is producing ahi for sale, the product will be tested for contaminants to determine their quality in an effort to meet our commitment to produce organic grade tuna.</u>	<u>1-20</u>
<u>Affected communities must benefit from this operation that encroaches on them. Will this proposed project benefit the local economy, including the island’s maritime, fish processing and distribution companies? (3,6)</u>	<u>This project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents, and steady contracts for the local maritime, fish processing, and fish distribution industries.</u>	<u>2-98 – 2-99</u>
<u>Is project consistent with open ocean aquaculture envisioned under the state’s ocean leasing law</u>	<u>The proposed project is consistent with the State’s Ocean Leasing Law and the Hawaii Ocean Resources Management Plan</u>	<u>3-1 – 3-7</u>

<p><u>and Ocean Resource Management Plan? (6)</u></p>		
<p><u>Food security is important to the Kohala community. How is this project going to help improve our local food security if your target markets are Japan and west coast North America? (1,2, 3, 4, 5, 6)</u></p>	<p><u>The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local residents. HOT plans to sell some ahi it produces in the local market, limiting it to about 10% of the local market. The main market is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the company’s employees and investors who are based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers.</u></p>	<p><u>2-98 – 2-99</u></p>
<p><u>There were not enough public meetings about this project. You need to have more community meetings and presentations. (6)</u></p>	<p><u>Over the last three years, HOT had many public meetings with community members, and individual and small group meetings. A public presentations at the Kawaihae Local Resource Council (KLRC), West Hawaii Fishery Council, participation in the open ocean aquaculture forum sponsored by KLRC. Additional public meetings will be held regularly with the community as the project moves forward.</u></p>	<p><u>1-25 – 1-26, 4-3 – 4-4</u></p>
<p><u>Did you have a public scoping meeting for this EIS? (6)</u></p>	<p><u>Since the initial work began on a draft Environmental Assessment, the project had several public meetings that served as scoping meetings. Input from these meetings resulted in the decision to do an EIS. Additional input was gathered in meetings with community members during the DEIS review period.</u></p>	<p><u>1-25 – 1-26</u></p>
<p><u>Did you have a public hearing? (6)</u></p>	<p><u>Yes, the public hearing was held April 14, 2009 in Kawaihae. It was announced as statutorily required and mentioned in an article in the local paper.</u></p>	
<p><u>Because of concerns about privatization of the oceans, is this project consistent with state laws and policies? (6)</u></p>	<p><u>This project does not conflict with the State’s long term environmental policies, goals and guidelines. The project will comply with the State’s Ocean Leasing Law (Chapter 190D HRS), and its legal framework for a sustainable ocean-based commercial aquaculture industry in Hawaii. 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, R-1, Aquaculture, D-1: “aquaculture under an approved management plan.” This project helps the State achieve its long term environmental policies, goals and guidelines. Specifically, Hawaii’s Ocean Resources Management Plan (ORMP) identifies one of the State’s Five Year</u></p>	<p><u>3-1 – 3-7</u></p>

	<p>Goals as <u>“Encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection.”</u> The Hawaii ORMP identifies the associated strategic actions as <u>promote alternative ocean energy sources; plan and develop sustainable commercial aquaculture in coastal areas and ocean waters; and expand ocean science and technology.</u> In direct support of the Hawaii ORMP Goals and Strategic Actions, the <u>Hawaii Oceanic Technology ahi aquaculture project will significantly advance ocean energy and aquaculture technology and help establish sustainable commercial aquaculture in Hawaii’s ocean waters.</u></p>	
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**After each comment, a number is listed which indicates the meeting or correspondence where the comment was made, including:

1. Comment made at a public presentation on proposal from Hawaii Oceanic Technology and comments from West Hawaii Fishery Council, April 23, 2007.
2. Comment made at a public scoping meeting on proposal from Hawaii Oceanic Technology held in conjunction with the Kawaihae Local Resource Council on August 3, 2008.
3. Comment made at a public forum on open ocean aquaculture including proposal from Hawaii Oceanic Technology organized by the Kawaihae Local Resource Council on April 3, 2009.
4. Comment made by long time fishermen of the area, as well as native Hawaiian and kamaaina families connected to the adjacent coastal lands, as presented in the Cultural Impact Assessment.
5. Comment made at the public hearing on the CDUA of Hawaii Oceanic Technology held by DLNR on April 14, 2009 regarding Hawaii Oceanic Technology.
6. Comment from letters written by the public on the Draft EIS, all of which are included in the Appendix to the Final EIS along with our response letters.

DLNR has stated they anticipate making a finding of no significant impact (FONSI) for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. Findings to support this determination are based on an analysis of the project relative to established “Significance Criteria” (Chapter 200, HAR), which are:

- (1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource?
- (2) Curtails the range of beneficial uses of the environment?
- (3) Conflicts with the State’s long term environmental policies or goals and guidelines?
- (4) Substantially affects the economic or social welfare of the community or state?
- (5) Substantially affects public health?
- (6) Involves substantial secondary impacts such as population changes or effects on public facilities?
- (7) Involves a substantial degradation of environmental quality?
- (8) Cumulatively has a considerable effect on the environment or involves a commitment for larger actions?
- (9) Substantially affects a rare, threatened or endangered species or its habitat?
- (10) Detrimentially affects air or water quality or ambient noise levels?
- (11) Affects or is likely to suffer damage by being located in an environmentally sensitive area?
- (12) Substantially affects scenic view planes or vistas?
- (13) Requires substantial energy consumption?

In the following section, each of these criteria is used to evaluate the Hawaii Oceanic Technology proposed ahi aquaculture operation. The analysis shows that the proposed project does not cause any significant impact, thereby supporting DLNR’s Finding of No Significant Impact (FONSI).

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource?

Hawaii Oceanic Technology’s proposed project will not involve any irrevocable commitment to loss of destruction of any natural or cultural resource. In the ahi aquaculture operation, the open ocean area and its resources will not be significantly affected. Ongoing monitoring programs will ensure compliance with environmental protection laws and regulations.

(2) Curtails the range of beneficial uses of the environment?

Fishing does not usually occur in the proposed ocean lease area. The proposed site may be used in transit from near shore fishing areas to offshore fishing areas to the south and west. Under the proposed project, fishing and boating would continue to be allowed in the proposed ocean lease area, except within 100' of the marker buoy above each Oceansphere. There is substantial sea room to maneuver around the Oceanspheres. This 100' safety zone around each buoy is for safety purposes and liability responsibilities of the company under the State lease. For liability reasons, no SCUBA diving or snorkeling is allowed in the ocean lease area. Though there was concern expressed by some fishermen that there would be a negative impact on bottom fishing, fishermen noted that the site is a mile away, and in 400' deeper than the habitat area or particular area of concern fished by bottom fish fishermen. The site is about 2 miles from the 'opelu fishing ko'a and the ono/mahi trolling lanes. Because of the distance from these fishing grounds, no impact is anticipated on any of these fisheries. Some beneficial impacts to area fishermen may occur with the Oceansphere acting as a Fish Aggregating Device, allowing the fishermen to increase catch in an area otherwise not usually fished, but sometimes transited.

(3) Conflicts with the State's long term environmental policies or goals and guidelines?

This project does not conflict with the State's long term environmental policies or goals and guidelines. The Hawaii Oceanic Technology Project will be in compliance with the State's Ocean Leasing Law (Chapter 190D HRS), which established the legal framework for a sustainable ocean-based commercial aquaculture industry to develop in the Hawaii. 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, R-1, Aquaculture, D-1: "aquaculture under an approved management plan." This project helps the State achieve its long term environmental policies, goals and guidelines. Specifically, Hawaii's Ocean Resources Management Plan (ORMP) identifies one of the State's Five Year Goals as "*Encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection.*" The Hawaii ORMP identifies the associated strategic actions as *promote alternative ocean energy sources; plan and develop sustainable commercial aquaculture in coastal areas and ocean waters; and expand ocean science and technology.* In direct support of the Hawaii ORMP Goals and Strategic Actions, the Hawaii Oceanic Technology ahi aquaculture project will significantly advance ocean energy and aquaculture technology and help establish sustainable commercial aquaculture in Hawaii's ocean waters.

(4) Substantially affects the economic or social welfare of the community or state?

The proposed project will result in some employment in the local community, and increased revenue for the contractors, suppliers and processors on the island. However, based on the number of people in the region of influence, this benefit is not expected to result in any significant economic effects. The company intends to start small and grow slowly and sustainably so that after five years, an estimated 22 full time employees will work for the company. This will benefit the local community, as the company anticipates being able to fill the jobs with local applicants.

(5) Substantially affects public health?

By providing a sustainable source of high quality fish protein to the local, US and overseas market, this proposed project will likely have some positive impact on public health. Otherwise, the proposed ahi aquaculture operation would not have a substantial impact on public health.

(6) Involves substantial secondary impacts such as population changes or effects on public facilities?

No substantial secondary impacts are anticipated, such as population changes or effects on public facilities.

(7) Involves a substantial degradation of environmental quality?

The ahi aquaculture operation does not involve a substantial degradation of environmental quality. The detailed water quality Zone of Mixing model for the ahi aquaculture operation shows that ambient nutrient levels are achieved by the edge of the zone of mixing and not measurable outside the zone of mixing. Because of the deep water and currents in the proposed site, the waste from the ahi aquaculture operation is rapidly assimilated. State water quality standards, with specific terms and conditions to be included in the NPDES permit. On-going water quality monitoring will be required to ensure compliance.

(8) Cumulatively has a considerable effect on the environment or involves a commitment for larger actions?

The ahi aquaculture project is not anticipated to have a considerable cumulative effect on the environment or involve a commitment for larger actions. This proposed open ocean aquaculture is the second one proposed for the West Hawaii coast. The existing Kona Blue Water Farms is located approximately 20 miles to the south of the proposed ocean lease site for Hawaii Oceanic Technology. Because of the long distance separating the two operations, and the evidence of no significant impact on water quality outside the zone of mixing from the Kona Blue operation, the cumulative impact from the proposed project is not anticipated to be significant. The proposed project includes the full build out plan for the company on the 247 acre ocean lease site. No additional commitment for expanding the lease area is envisioned in this proposed action.

(9) Substantially affects a rare, threatened or endangered species or its habitat?

The proposed ahi aquaculture project does not substantially affect rare, threatened or endangered species or its habitat. The proposed ocean lease site is located one mile outside the Hawaiian Islands Humpback Whale National Marine Sanctuary. Technology design minimizes any entanglement risk to marine mammals, reduces risk of fish escapes causing unintentional provisioning of marine mammals, and minimizes any underwater noise impacts on the marine acoustical environment. Monitoring plans for marine mammals and sea turtles, a shark safety plan, and an emergency response plan all will help ensure compliance with State and Federal environmental quality and protected species laws and regulations.

(10) Detrimentially affects air or water quality or ambient noise levels?

The proposed project and its operations are not anticipated to have any significant adverse impacts on air or water quality or ambient noise levels. Renewable energy systems reduce the carbon emissions from the ahi aquaculture operation. Water quality is protected by a combination of technology design, deep water and strong currents, and best management practices for open ocean aquaculture. Low energy thrusters are used to maintain the

Oceanspheres on station, which produce sound at levels below any threshold of significance for marine mammals, sea turtles and fish.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area?

The proposed ocean lease site is located 2.6 nautical miles from shore in waters 1,320 feet deep, with strong currents and a rocky basalt bottom substrate. The site is a mile away in 400' deeper waters than that fished by fishermen, designated bottom fish habitat of particular concern. The site is about 2 miles from the 'opelu fishing ko'a and the ono/mahi trolling lanes. No impact is anticipated on any of these fisheries.

(12) Substantially affects scenic view planes or vistas?

The proposed project would not substantially affect scenic view planes or vistas. Individuals and families who have worked, played, camped and shore-fished along the shoreline adjacent to the proposed site for multiple generations were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews in the Cultural Impact Assessment, each of them said it wouldn't affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the view shed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices, and beliefs of the coastal lands.

(13) Requires substantial energy consumption?

There will be insubstantial amounts of energy used to power the boats and equipment. The Oceansphere does not require substantial energy consumption. The technology is a very good example of a hybrid vehicle. The Oceansphere will run an engine based on renewable energy, wave power generation and biofuel engines to keep a bank of batteries charged. The batteries power electric motors driving the propellers and control systems. Much the same as a diesel electric train or submarine, only in this case a solar ocean thermal conversion process is planned because it is highly efficient and can use the ambient solar and ocean thermal energy to help generate electricity. The up and down vertical motion of waves power is used to assist power generation and a biofuel engine will ensure that the Oceansphere always has enough power to operate 24 hours a day, seven days a week.

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- A User and Vessel Surveys
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LIST OF ACRONYMS

Acronym	Full Phrase
AIRFA	American Indian Religious Freedom Act
APE	area of potential effects
ARPA	Archaeological Resources Protection Act
ATI	area of traditional importance
CDUA	Conservation District Use Application
CE	
CERCLA	Comprehensive Environmental response, Compensation, and Liability Act
CII	Cates International, Inc.
CWA	Clean Water Act
CZM	Coastal Zone Management
DBEDT	Department of Business, Economic Development, and Tourism
DLNR	Department of Land and Natural Resources
DOBOR	Division of Boating and Ocean Recreation
DOD	Department of Defense
DOE	Department of Education
DPS	dynamically positioning system
EA	environmental assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FADS	fish aggregation devices
FHWA	Federal Highway Administration
GPS	global positioning system
HAPC	Habitat Area of Particular Concern
HAR	Hawai'i Administrative Rules
HDEBDT	Hawaii Department of Business Economic Development
HDOE	Hawai'i Department of Education
HDOH	Hawai'i Department of Health
HDOH CWB	HDOH Clean Water Branch
HDOT	Hawai'i Department of Transportation
HELCO	Hawaiian Electric and Light Company
HIHWNMS	Hawaiian Islands Humpback Whale National Marine Sanctuary
HIMB	Hawai'i Institute of Marine Biology
HRS	Hawai'i Revised Statutes
INS	Inertial Navigation System
KBWF	Kona Blue Water Farm
LOS	level of service
LST/LSV	Level of service
MBTA	Migratory Bird Treaty Act
MHI	Main Hawaiian Islands
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MP	Monitoring plan
NAGPRA	Native American Graves Protection and Repatriation Act
NELHA	Natural Energy Laboratory of Hawai'i Authority
NHPA	National Preservation Historic Act
NMFS	National Marine Fishery Services
NMS	National Marine Sanctuary
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System

LIST OF ACRONYMS

Acronym	Full Phrase
NPP	Net primary productivity
NPS	National Park Service
NRHP	National Register of Historic Places
NSMBHSP	National Seafloor Mapping and Benthic Habitat Studies Project
NTU	Nephelometric Turbidity Units
NWHI	Northwestern Hawaiian Islands
OHA	Office of Hawaiian Affairs
OOA	open ocean aquaculture
OSHA	Occupational Safety and Health Administration
OTEC	<u>Ocean Thermal Energy Conversion</u>
PACRC	Pacific Aquaculture & Coastal Resources Center
PCB	polychlorinated biphenyl
PIRO	Pacific Island Regional Office
POP	Persistent Oceanic Power
ROI	Region of Influence
ROV	Submersible-supported research vessel
SCUBA	Self-contained Underwater Breathing Apparatus
SML	surface mixed layer
TCP	traditional cultural places/properties
TSS	total suspended solids
US EPA	United States Environmental Protection Agency
USACE	United States Army Corp of Engineers
USCG	United States Coast Guard
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
ZOM	Zone of Mixing

CHAPTER 1

INTRODUCTION

This environmental impact statement (EIS) evaluates Hawaii Oceanic Technology’s proposal to raise yellowfin tuna (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) in submerged aquaculture platforms, which are termed “Oceansphere”, three miles (2.6 nautical miles (nm)) offshore Malae Point, North Kohala on the Island of Hawai‘i. This EIS has been 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.

1.1 SITE OVERVIEW AND BACKGROUND

Hawaii Oceanic Technology intends to raise 6,000 tons (5,443 metric tonnes) per year of yellowfin tuna (*Thunnus albacares*) and/or bigeye tuna (*Thunnus obesus*) 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 2013. 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) and/or a future commercial tuna hatchery at Natural Energy Laboratory Authority NELHA, Kona. Each Oceansphere will be fitted with an automated feed dispenser surface buoy. The tuna will be hatched at PACRC/NELHA 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.

1.1.1 Identification of Applicant

The applicant is Hawaii Oceanic Technology, Inc. The primary contact and authorized representative for the Hawaii Oceanic Technology is Bill Spencer, Chief Executive Officer of Hawaii Oceanic Technology.

Hawaii Oceanic Technology, Inc.
425 South Street, Suite 2902
Honolulu, Hawai'i 96813
Telephone: 808-225-3579
Fax: 808-528-4751
www.kingahi.com

1.1.2 Identification of Accepting Authority

The accepting authority for the Proposed Action is the Department of Land and Natural Resources (DLNR). The primary contact is Laura Thielen, Chairperson.

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

1.1.3 Project Summary

<i>Project Name:</i>	Ahi Aquaculture Project
<i>Location(s):</i>	State Marine Waters off of the North Kohala Coast, approximately three miles (2.6 nautical miles) due southwest of Malae Point (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.
<i>Judicial District:</i>	North Kohala
<i>Applicant:</i>	Hawaii Oceanic Technology, Inc.
<i>Recorded Fee Owner:</i>	State of Hawai'i
<i>Land (Ocean) Area:</i>	247 acres (1.0 sq km) (Proposed Action)
<i>Existing Use:</i>	Conservation
<i>State Land Use:</i>	Conservation
<i>Subzone:</i>	Resource
<i>Marine Water Class:</i>	A
<i>Marine Bottom Ecosystem:</i>	II
<i>County General Plan LUPAG:</i>	Ocean site has no LUPAG designation, <u>Kawaihae C. Harbor is Urban</u>
<i>County Zoning:</i>	Ocean site has no County zoning, <u>Kawaihae C. Harbor zoned MG-1a</u>
<i>Special Management Area:</i>	Ocean site is not in SMA, <u>Kawaihae Commercial Harbor is in the SMA</u>
<i>Accepting Authority:</i>	Department of Land and Natural Resources, Office of Conservation and Coastal Lands

1.2 PURPOSE AND NEED

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 by up to 90 percent from 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 (OOA), 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.

With the world's high demand for tuna and current industrial fishing techniques, stocks of yellowfin and bigeye tuna are being harvested at unsustainable rates. The Japan market for sashimi-grade tuna is approaching 694,456 tons (630,000 metric tonnes) per year, and California and other metropolitan areas in the United States consume 49,604 tons (45,000 metric tonnes) per year. Depletion of other fish stocks has had direct market effects; in the case of swordfish, more than 1,000 US mainland restaurants have stopped serving swordfish dishes because of its scarcity. The growing sensitivity to diminishing ocean resources and the desire for a quality product underscore the need to provide an alternative source of tuna.

The future of global seafood production will likely rely on OOA, which has a number of advantages over traditional methods of aquaculture. By designing their OOA project using green technology, Hawaii Oceanic Technology will produce a high-quality, high-grade sustainable source of protein in an environmentally sensitive manner and grown in the deep ocean waters on the lee side of the island of Hawai'i. 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 State of Hawai'i has the largest jurisdictional area of internal waters in the US and is one of the largest Exclusive Economic Zone (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 (Hawai'i State GIS, see appendix), and the waters become very deep close to shore, leading to ideal conditions for the mixing and recycling of waste.

1.3 SCOPE OF ANALYSIS

This EIS has been developed in accordance with Hawai'i's environmental impact statement law (HRS 343) and with guidance from the Office of Environmental Quality Control (OEQC). Its purpose is to inform decision makers and the public of the likely environmental consequences of the proposed action.

This EIS identifies, documents, and evaluates the effects associated with the proposed Ahi Aquaculture Project. An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, and archaeologists has analyzed the proposed action in light of existing conditions and has identified relevant beneficial and adverse effects associated with the proposed action. The preferred site of the proposed action is described in Section 1.4. A description of an alternative site and a no action alternative are described in Section 1.5. Conditions existing as of 2006 and 2008, considered to be the "baseline" conditions, are described in Section 2.0, Affected Environment. The expected effects of the proposed action, cumulative actions, and no action alternative, along with possible mitigation measures for those effects, are described in Section 2.0, Environmental Consequences.

1.4 DESCRIPTION OF THE PROPOSED ACTION

This section describes the proposed action with the preferred site. Following this is a section that evaluates the alternative site and a no action alternative. The anticipated determination for the proposed action is a finding of no significant impact.

Hawaii Oceanic Technology intends to raise 6,000 tons (5,443 metric tonnes) per year of yellowfin tuna and bigeye tuna in a one square kilometer ocean lease site located 2.6 nautical miles (4.2 kilometers) offshore Malae Point, North Kohala, segregated by species in twelve submerged Oceanspheres when fully operational by 2013. 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) and/ or Natural Energy Laboratory Authority NELHA hatchery. Each Oceansphere will be fitted with an automated feed dispenser. The tuna will be hatched at PACRC/ NELHA 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.

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. 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. Oceanspheres may be sent down to depths above 100 m for yellowfin and 200 m for bigeye prior to harvesting to place the tunas in colder water while maintaining sufficient dissolved oxygen levels, in order to build on their fat content. Yellowfin tuna routinely dive to 100 m and bigeye tuna dive to 200 m, for hunting.

A smaller beta-version Oceansphere fitted with a commercially available biofuel generator will be constructed and tested in the ocean before full sized Oceanspheres are deployed. Additionally, a routine testing and evaluation period will be conducted before tuna are stocked in the Oceanspheres.

Project Location for Proposed Action – Malae Point (Preferred Alternative)

The Hawaii Oceanic Technology Ahi Aquaculture Project proposes to operate from an ocean lease site based three miles (2.6 nautical miles (nm)) offshore Malae Point in North Kohala (See Figure 1-1), and a commercial site leased for the company's operations base at Kawaihae Commercial Harbor (See Figure 1-2). The one square kilometer open ocean aquaculture site is 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 company intends to lease an existing building in the harbor. However, should there be no existing building available for lease, then the company will lease an area of undeveloped land within the Kawaihae Commercial Harbor and build its own office and work yard. County SMA permit and building permits would be necessary for such improvements.

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 OOA 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 1-1. Proposed Action: Preferred OOA 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).

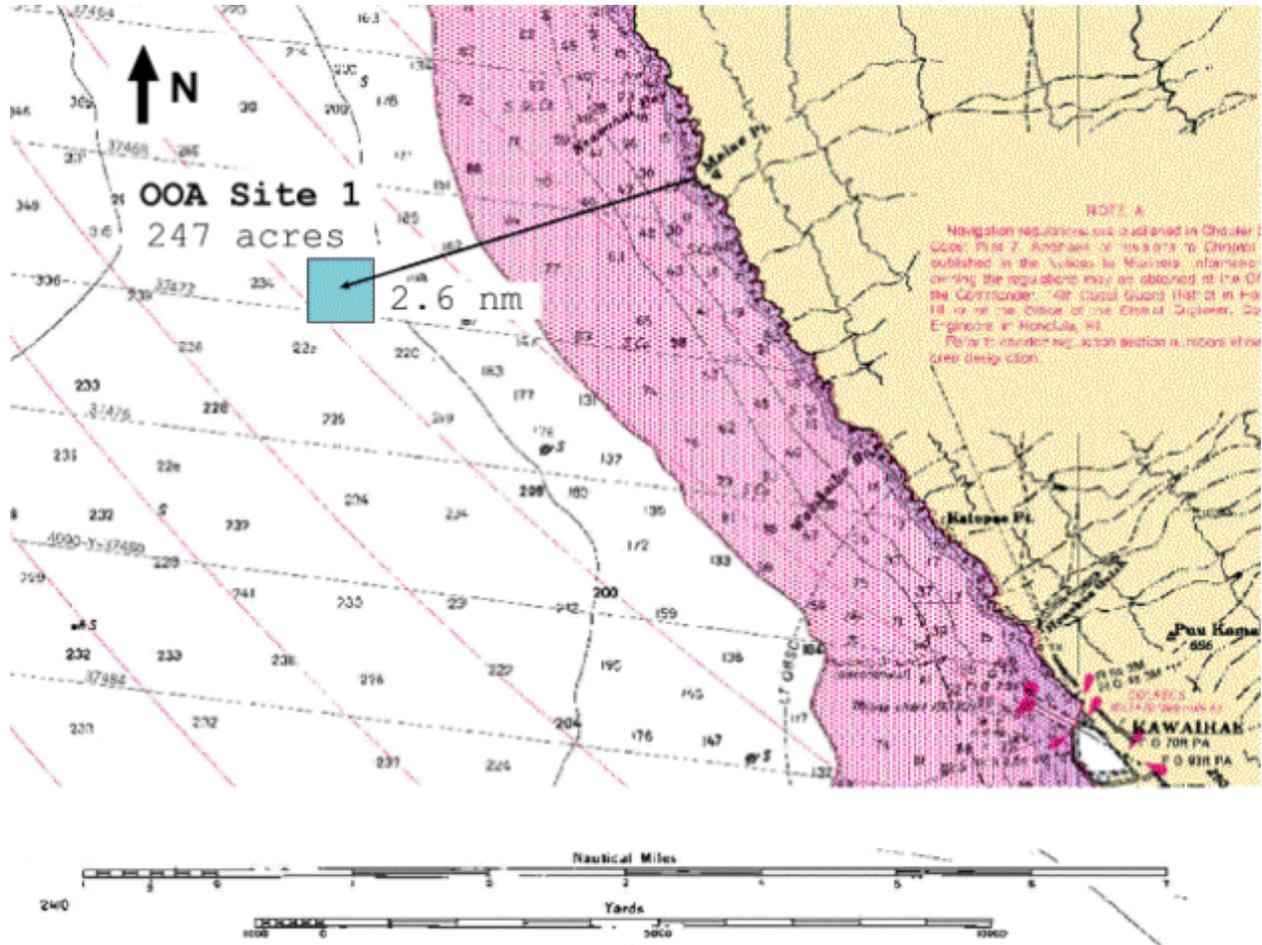
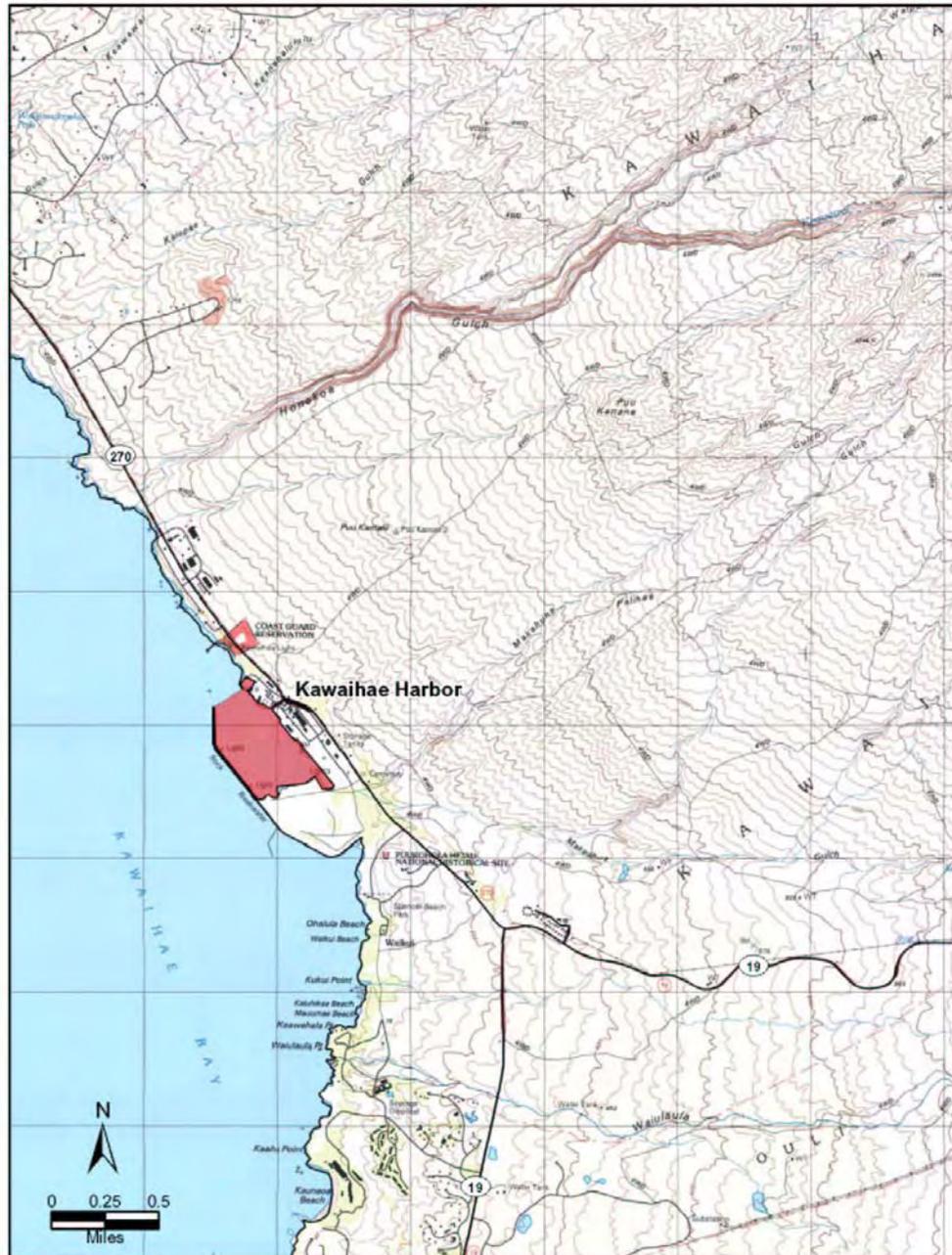


Figure 1-2. Kawaihae Commercial Harbor.

Kawaihae Commercial Harbor has 23 boats moored with their own tackle in the commercial deep-draft harbor, two Tahiti-style moorings, a container loading area, a container lot, and a loading pier.

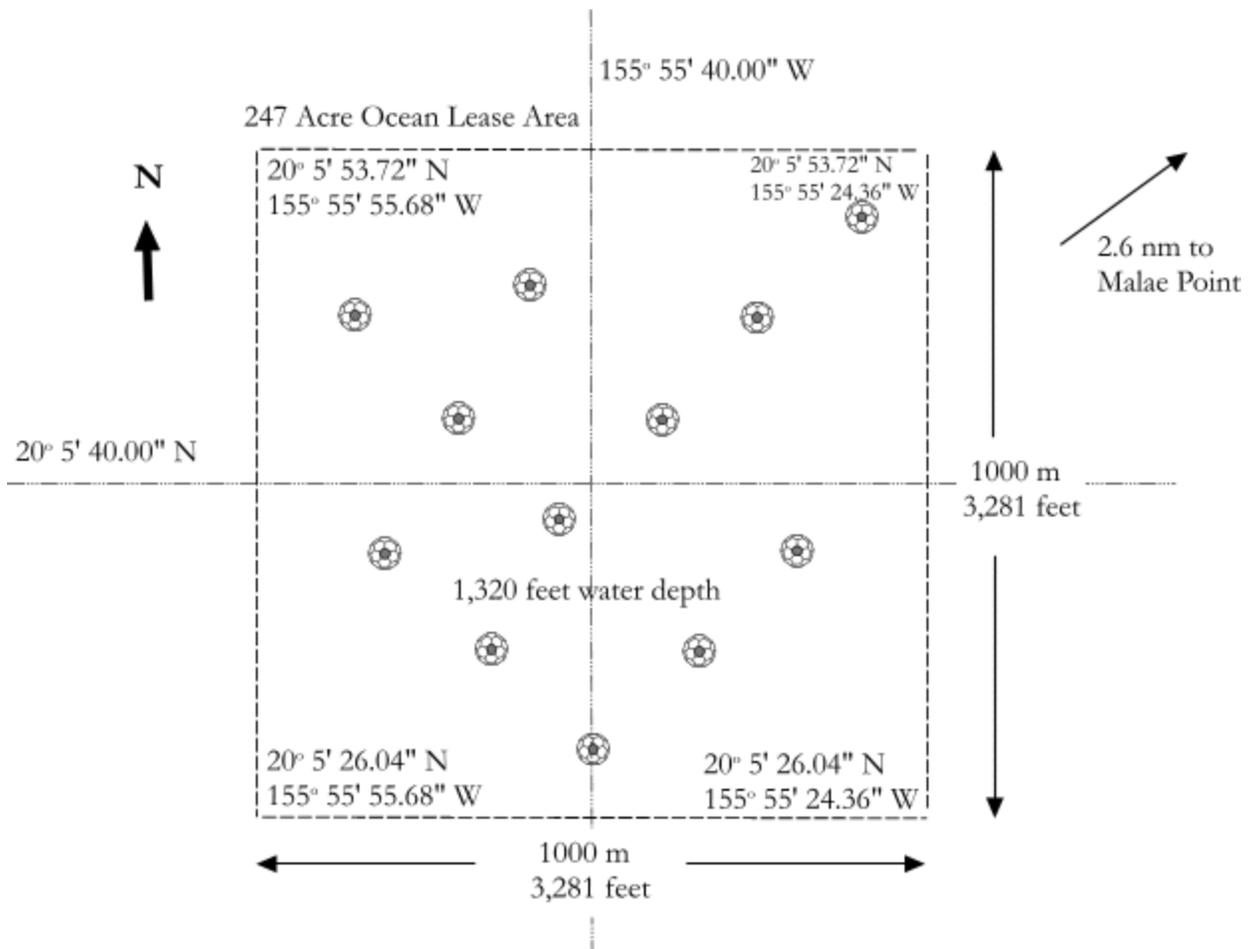


The proposed location of the open ocean Oceanspheres is off the North Kohala Coast of the Island of Hawai'i. The Oceanspheres will be three miles offshore and will be outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS), shown in purple in Figure 1-1. The area proposed for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

Final deployment will culminate after five years with all twelve Oceanspheres being evenly distributed in the lease site, as shown in Figure 1-3. 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. Oceansphere may be sent down to above 100 m for yellowfin and 200 m for bigeye prior to harvest for fattening in colder waters.

Figure 1-3. Map of the Proposed Action at Preferred OOA 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, as described below. 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.

Oceansphere Description

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 40,000 to 82,406 cubic meters, stocking density is less than 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 or High Density Poly-Ethylene (HDPE) covered in taut, anti-fouling netting. The netting is approximately one-square-inch stitching made from 0.08-inch- (0.002-meter-) diameter commercially available offshore netting such as ~~Kevlar manufactured by Diamond Nets, Everson, WA~~ Kikkonet mesh netting, and/ or ultra high molecular weight polyethylene Dyneema fiber available from DSM Dyneema®. The soft, torque free braided construction of these nettings 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 (Figure 1-4). The propulsion system includes a Persistent Oceanic Power (POP) patent application USPTO 11/849,338) generator and/ or a biofuel engine and duplicated x,y,z tunnel electric thrusters that will be used to position the Oceansphere (Figures 1-4 and 1-5). Figure 1-6 is a scaled drawing of the Oceansphere in relation to the water depth at the Proposed Action at Preferred OOA Site 1.

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 s~~ Shielded electric tunnel thrusters are located in the central stem either/ or the sphere wall and 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 1-4 – GPS/Inertial Navigation System

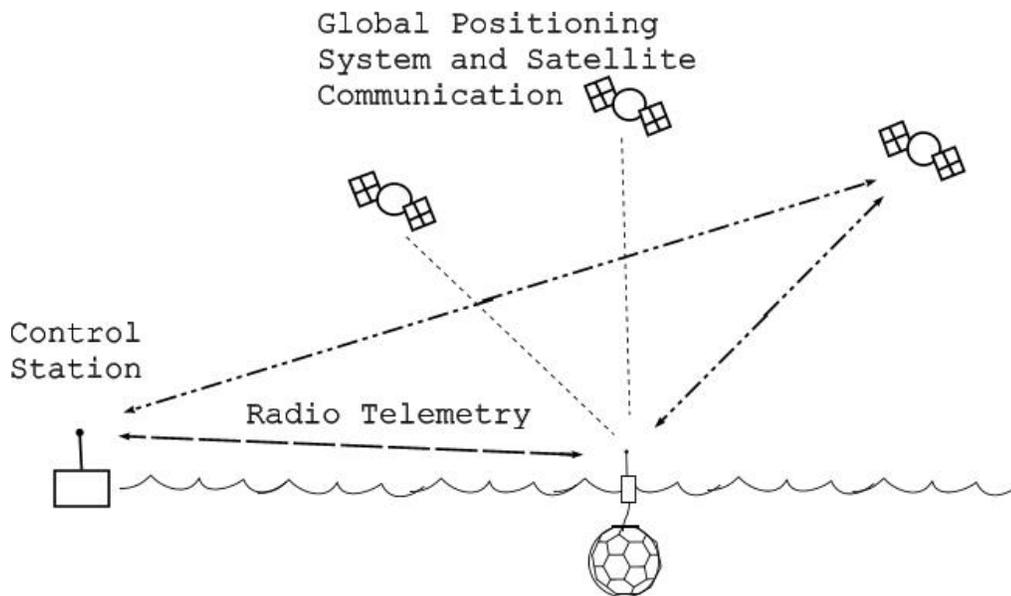
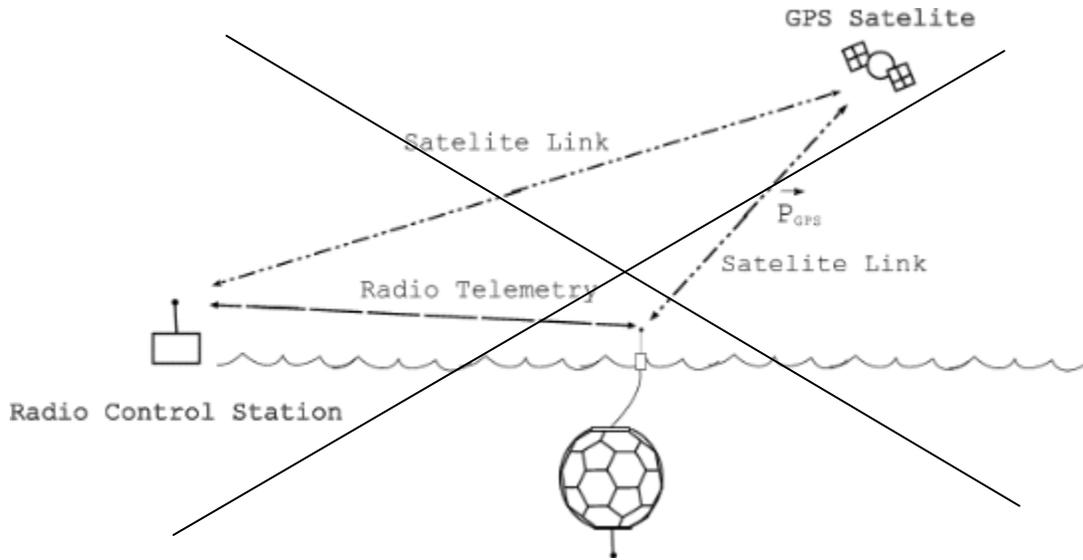


Figure 1-5. Oceansphere Schematic

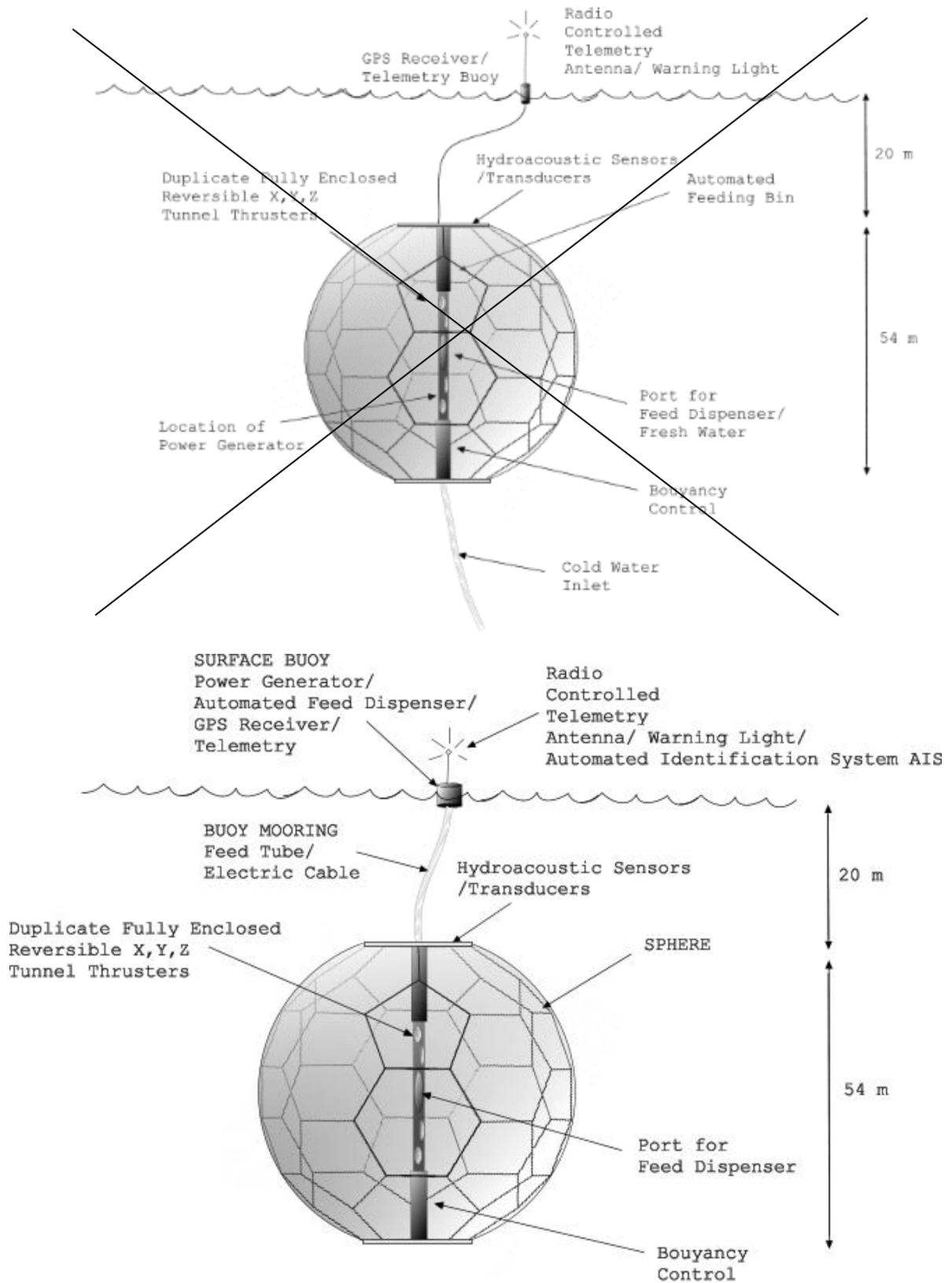
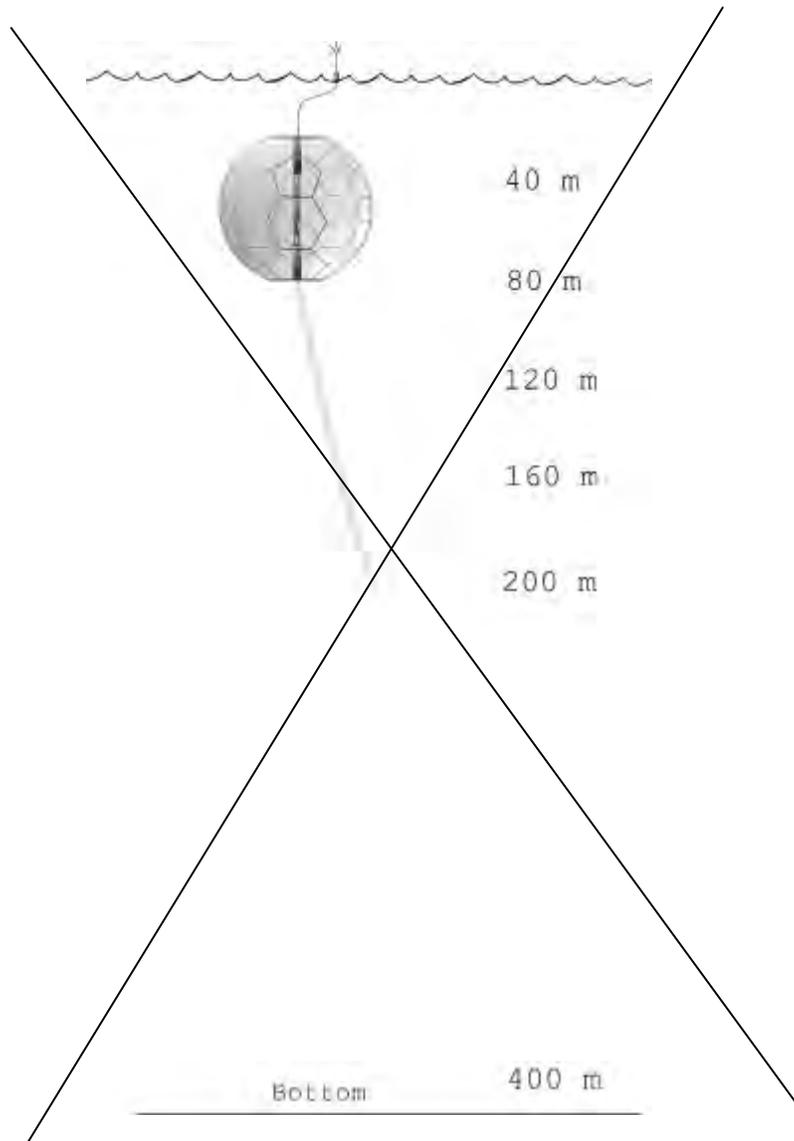
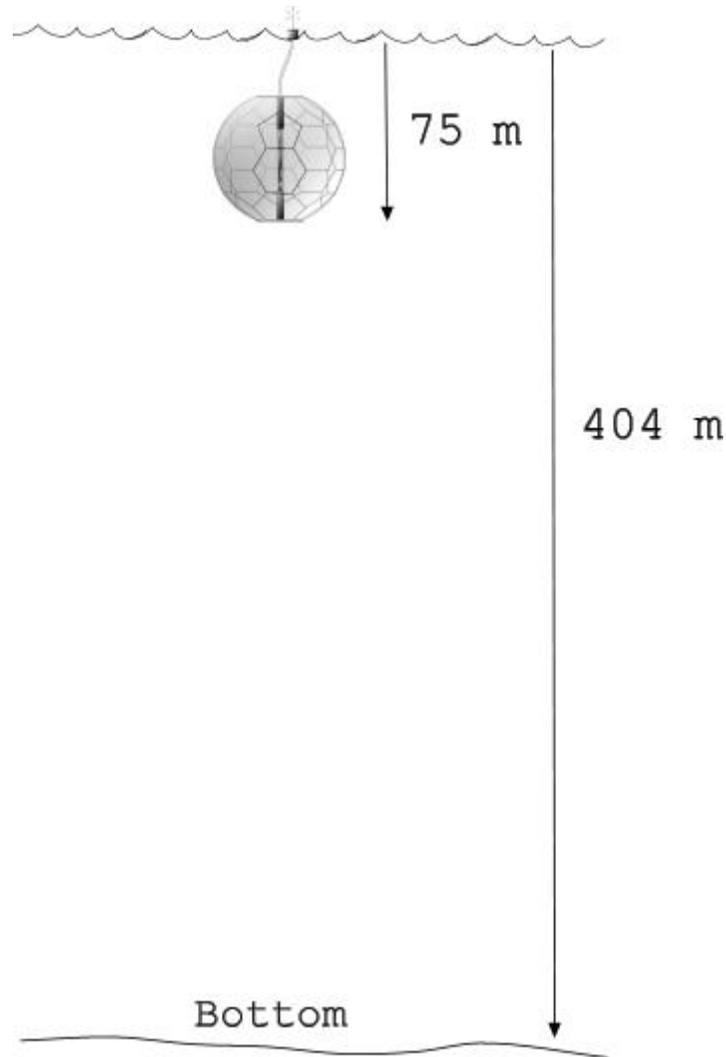


Figure 1.6 Scaled drawing of Oceansphere in comparison to the water column depth at the North Kohala Ocean Lease Site.

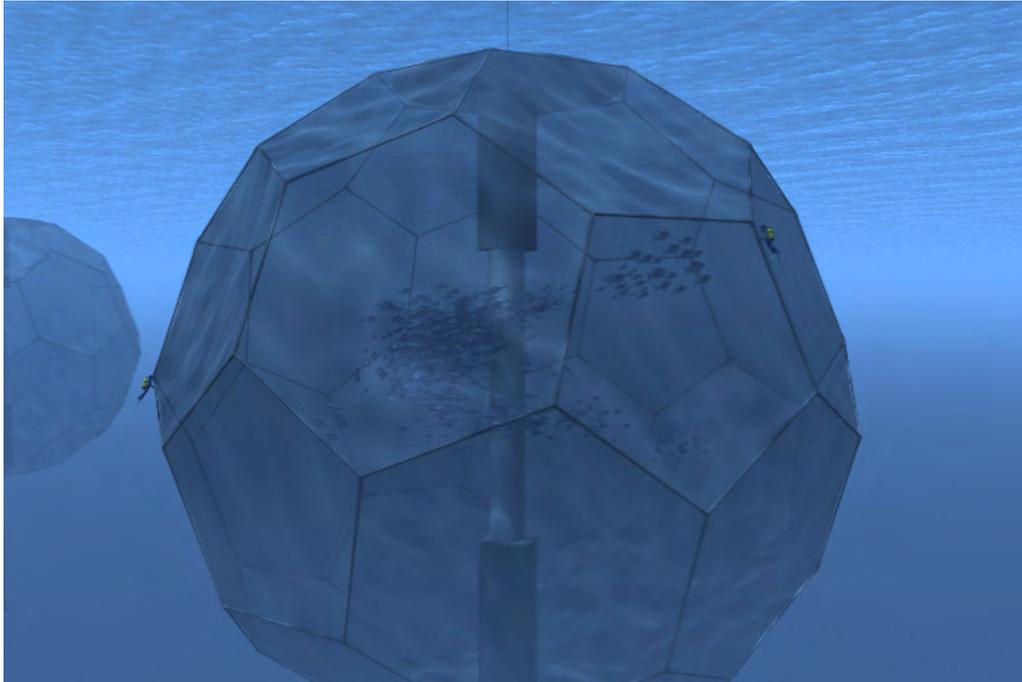




The Oceansphere will be developed by building and testing a smaller version which uses a biofuel generator as its power source. The prototype unit will be approximately 40 m in diameter and will be deployed without tuna for a testing and evaluation period. This is the first Oceansphere described in the timeline.

Approximately 7 tuna per year will be caught in waters off the Island of Hawaii and used as broodstock to produce fingerlings from eggs under contract to PACRC in Hilo. The fingerlings will be placed in the holding tank of a ship and transported from Hilo to the OOA site, where they will be pumped through a hose into the submerged Oceanspheres. Yellow fin tuna and big eye tuna would be grown in separate Oceanspheres.

Figure 1-7. Open Ocean Oceanspheres Artist's Rendering.



Should the propulsion system malfunction the Oceansphere would automatically send a distress signal through the radio telemetry system and remain at depth until 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 “mostly subsurface” floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT Professor, *as per. 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. A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area (see Appendix C) 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.

Propulsion and Power

The propulsion and power generation system is similar to a modern diesel electric (D/E power-train) submarine in layout but smaller and more efficient. A hybrid ocean thermal power generator based on a Stirling engine, which we call persistent oceanic power, POP, will replace the diesel engine and maintain banks of batteries that connect to shielded x,y,z reversible tunnel electric thruster for propulsion. POP is a Carnot efficiency heat sink engine which utilizes the thermal gradient in the upper oceanic water column to efficiently produce electricity in order to charge batteries in a similar way that hybrid automobiles use an internal combustion engine to charge batteries which provide power to an electric motor.

The Oceansphere is a very good example of a hybrid vehicle. The Oceansphere will run a Stirling engine, wave power generator and biofuel engine to keep a bank of batteries charged and in periods of high current activity. The batteries power electric motors driving the propellers and control systems. Much the same as a diesel electric train or submarine, only in this case a solar ocean thermal conversion Stirling Engine is used instead of only a diesel engine because it is highly efficient and can use the ambient solar and ocean thermal energy to ~~help~~ drive the Stirling cycle. The Swedish Navy ~~have~~has developed Stirling submarine propulsion systems for much these same reasons and ~~manufacture~~manufactures the Viking Class Attack Submarine. There are also commercially available marine generators made by WhisperGen in New Zealand, and Marine Stirling in Florida that ~~are~~is based on seawater cooled Stirling Engines.

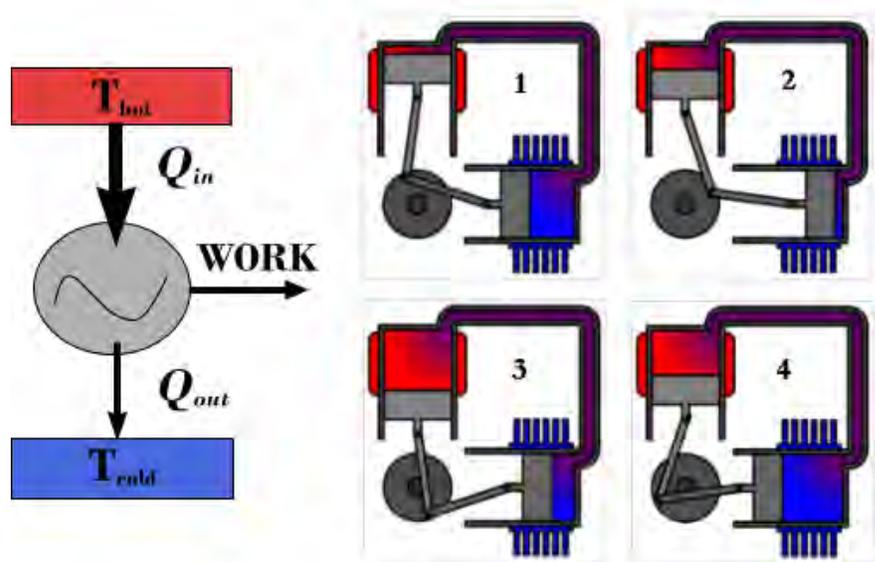
A Fresnel lens like solar concentrator will provide heat and surface seawater will ~~Ocean water at a temperature of 10 °C will be pumped up from a depth of 200 m to~~ provide a heat sink for the Stirling cycle used to produce electricity to operate the thrusters for the Oceanspheres under average conditions. The up and down vertical motion of waves power is used to assist ~~the cold water to the surface~~ power generation and a biofuel engine will ensure that the Oceansphere always has enough power to operate 24 hours a day and 7 days a week. Internal shielded electric x,y,z tunnel thrusters located in the Aquasphere stem will dynamically position the Oceansphere. An onboard computer and land to shore network will provide control and monitoring of onboard electronics, navigation control, communications and emergency systems. All power generation and routing will be directed by onboard computers that will monitor and control Oceansphere operations. A gyro inertial system will be employed when satellite communication isn't available to self position the Oceansphere.

POP is a closed cycle engine in which the working fluid, an inert gas, is sealed within the engine and not open to the environment. POP utilizes a temperature difference to expand and contract a working gas to move a piston and produce rotary power. The Stirling device converts heat into rotary power by continuous heating and cooling of a captive gas. The device operates on the principle that a gas (in this case helium) expands when heated and contracts when cooled. There are no byproducts of combustion coming into contact with the moving parts of the device increasing reliability and reducing maintenance. Solar concentrator ~~H~~heater elements are connected to the cylinders along with heat exchangers. The working gas, which moves back and forth between the hot piston and the cold piston is

connected to heat exchanger where heat is rejected to the cooling system water. This action of heating and cooling the helium changes its pressure and exerts a force on the pistons that drive the crankshaft thus turning the enclosed alternator to produce electricity. A diagram of a heat sink engine and Stirling engine operation is shown in Figure 1.8.

With this power source the Oceansphere can submerge to predetermined depths and communicate with the GPS and other Oceanspheres while submerged. Modern Stirling prime movers are external combustion engines which consistently demonstrate higher efficiency, multifuel capability, lower exhaust emissions, quieter operation, equivalent power density, and superior torque characteristics than other engines. A number of engine designs are currently commercially available and Stirling Energy Systems manufactures a 25 Kilo Watt Stirling engine.

Figure 1.8 – Diagram of Persistent Ocean Power. POP produces work from a thermodynamic heat sink (left) and employs a Stirling engine cycle to efficiently produce electricity (right).



Dynamic positioning systems

A seagoing vessel is subject to the forces of wind, waves and current and those generated by the propulsion system. In a dynamic positioning system the response to these forces in terms of changes in position, heading and speed, are measured by position-reference systems, gyrocompass and the satellite global positioning system (GPS). The dynamic positioning system calculates the forces that the thrusters must produce in order to control the vessel's motion. The dynamic positioning systems controller calculates the resulting force to be exerted by the thrusters/propellers in order for the vessel to remain on station. High Precision dynamic positioning systems control provides high accuracy station-keeping in any weather condition.

Dynamic positioning (DP) started in the 1960s for offshore drilling. In 1961 the drillship Cuss 1 was fitted with four steerable propellers, in an attempt to drill the first Moho well. It was possible to keep the ship in position above the well off La Jolla, California, at a depth of 948 meters. After this, off the coast of Guadalupe, Mexico, five holes were drilled, the deepest at 183 m (601 ft) below the sea floor in 3,500 m (11,700 ft) of water, while maintaining a position within a radius of 180 meters. The ship's position was determined by radar ranging to buoys and sonar ranging from subsea beacons.

Whereas the Cuss 1 was kept in position manually, later in the same year Shell launched the drilling ship Eureka that had an analogue control system interfaced with a taut wire, making it the first true DP ship. While the first DP ships had analogue controllers and lacked redundancy, since then vast improvements have been made. DP is not only used in the oil industry, but on various other types of ships. With the advent of the GPS, dynamic positioning has become widespread with present day applications which include drill ships, cable-laying vessels, crane vessels, cruise ships, diving support vessels, dredgers, maritime research vessels, mine sweepers, Oceansphere supply vessels, rock dumping vessels, survey ships, supply vessels, and shuttle tankers.

Feeding

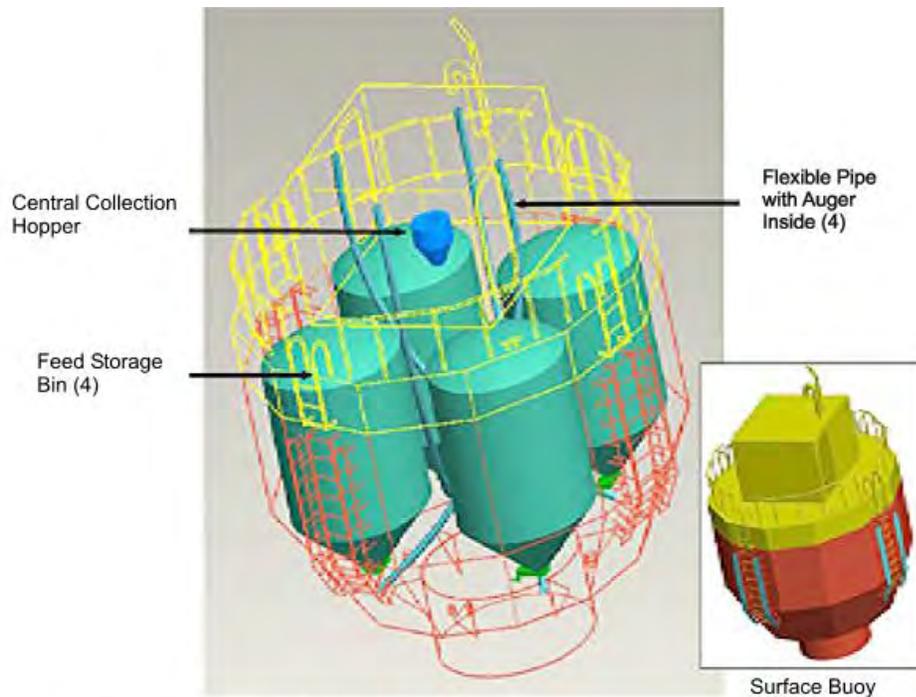
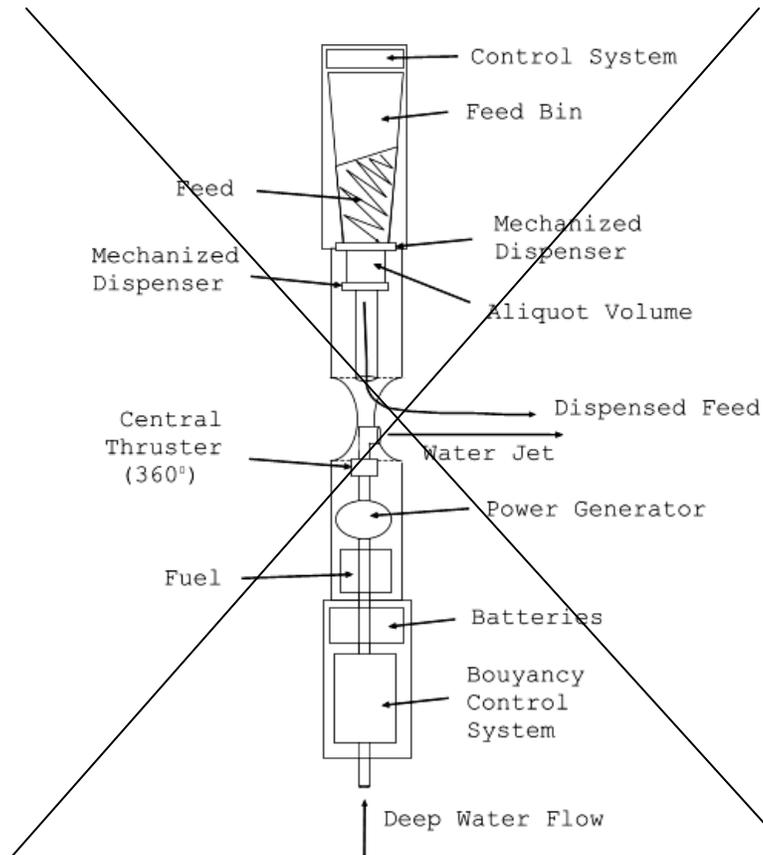
Ahi require two pounds of dry feed for every pound of wet weight that they grow; for example, 200 lbs (90.7 kilograms) of dry feed will be required to grow a 100-lb (45.4 kilograms) tuna. Dry feed will be purchased from a commercial supplier and shipped to Kawaihae Commercial Harbor. The source of the feed is determined by the supplier, and Hawaii Oceanic Technology will specify the content of the feed and quality standards. The standard composition of the feed is 85 % soy or other protein, 1 % vitamins and 15 % fish meal or oil. The feed will be inspected by the Hawai'i Department of Agriculture before being accepted. 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, if necessary. Ian Birnie Hawai'i District Manager for DOT Harbors Division, now retired, has been consulted on the project and space requirements at Kawaihae Commercial Harbor. The company has since participated in the stakeholders meeting of the Kawaihae Commercial Harbor 2035 Master Plan to present their company's requirements for facilities and space at the harbor. This consultation will continue as the company's permitting process proceeds.

When fully operational in 2013 the company will require 1,000 tons (900 metric tonnes) of feed stock per month arriving in 40 containers. This supply will be received at Kawaihae Commercial Harbor. The feed will be loaded into feeding canisters for shipment to the OOA site. Once on station, empty canisters, located in the surface buoy central stem of each Oceansphere, will be replaced. Feed will be dispensed into a feed tube which is connected to ~~a with an automated~~ feed dispenser built into the stem of the aquaculture Oceansphere once a day (See Figure 1.9). A crane onboard the feed boat will be used to replace the canisters.

No ground transportation of feed is anticipated other than within the Kawaihae Commercial Harbor area.

The fish feed initially proposed to be used in the operation is pellet fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The company has no plans to use GMO soy. The company plans to produce the highest quality ahi, suitable for sashimi. When the National Organic Standards Board finalizes its organic standards, Hawaii Oceanic Technology plans to follow its requirements for organic aquaculture.

Figure 1.9 – Diagram of ~~stem~~ Surface Buoy showing automated feeding dispenser



Taken from UNH OOA website with permission

Once on station, the food canisters will be transferred into the surface buoy stem of the Oceanspheres. This will occur twice a month during maintenance activities and will take approximately four hours. The company is forging partnerships with local farmers to reduce the need for acquiring feed from outside Hawai'i by supplementing the fish-based feed stock with a byproduct of bio-diesel production which is algal protein. SCUBA divers will periodically observe and record feeding behavior, and video monitoring of feeding will be conducted remotely, and this information will be used to maximize the feeding efficiency. An internal small netting system will allow smaller sized fingerlings to be stocked in the Oceansphere. The netting will be removed and the tunas will populate the entire cage when they are large enough for the Oceansphere netting.

Oceansphere Maintenance and Tuna Health Inspections

SCUBA divers will be deployed almost daily to inspect the health of the tuna, and observe the feeding of tuna. Unmanned underwater robots, such as Seabotix, San Diego, 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. To maintain optimal health, the Oceansphere allows for a generously low 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 , and/or the Disease Management Program of the Aquaculture Development Program in the Hawaii Department of Agriculture."

Hawaii Oceanic Technology will contract with a third party salvage/emergency team to be on call 24 hours to retrieve Oceanspheres in the event they begin to drift off station (i.e., Chuck Wilson, Fire Hatt, Kailua-Kona, and Hawaiian Interisland Towing Inc., Pier 21, Honolulu, HI 96813. Operators will monitor the position of the Oceansphere 24 hours a day and 7 days a week. If the Oceansphere should encounter difficulty the Coast Guard will be notified by the operator by phone immediately.

Periodically, Oceanspheres will be disassembled at the ocean lease site and placed on a ship for transport to the maintenance site at Kawaihae Commercial Harbor for refitting before

being redeployed. Any periodic repairs will take place on site. To disassemble the Oceansphere, the center stem will be attached to a line from an A frame from the work boat. Divers will disassemble the cage by unbolting the individual panels and stacking them on the deck of the work ship. The center stem will then be brought onboard the ship ~~and the cold water pipe disassembled.~~ The cage ~~and the cold water pipe are~~ is a modular design and ~~are~~ easily disassembled at sea.

Fishermen are allowed to fish around the oceanspheres, but not above or below them. For safety reasons, all boaters are asked to keep 100' from the oceansphere's surface buoy. For liability reasons, the public is asked not to swim or SCUBA dive anywhere in the ocean lease area. The surface beacon will be equipped with warning lights and video cameras. If a boat should approach a warning message will be broadcasted to stay 100 feet from the beacon. If the boats continue to approach a work boat will be dispatched from Kawaihae Harbor.

Harvesting

Tuna will be harvested from the Oceanspheres 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 to an appropriate vendor, such as Kaloko Light Industrial Park, located at 73-4776 Kanalani Street #8, Kailua-Kona, Hawaii. Or if necessary, the harvested fish could be 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 vessels will be in harvest mode in any one year with a total production capacity of 6,000 tons. Fish will be harvested after reaching approximately 100 pounds. One Oceansphere will be harvested approximately every month; all Oceanspheres will be harvested once each year when fully deployed in 2013. All Oceanspheres will not be harvested at once, but will be spread out throughout the year so as not to flood the market with product. The Oceanspheres will be stocked in place and grow-out will take approximately one year. Our annual production schedule is estimated at 1,000 tons by 2011, 3,000 tons by 2012, and 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 Alternatives Analysis

In addition to the Preferred Location for the Proposed Action at the location offshore Malae Point, North Kohala, alternative open ocean aquaculture sites offshore Milolii, Keauhou Harbor and Keāhole Point were considered. Of these alternative sites, the one which was the subject of more extensive research and analysis than the other alternatives was the Keāhole site, which is presented as Alternative Open Ocean Aquaculture (OOA) Site 2.

Each section in Chapter 2 will discuss the resources and potential impacts for the Proposed Action, as well as for Alternative Site 2, and the Alternative 3 of No Action. A comparison chart is provided in each section of Chapter 2 that compares the alternatives between the Proposed Action, Alternative Site 2 and Alternative 3 (No Action). Section 2.12 provides a compilation of this alternatives analysis.

It became clear after continued research, stakeholder meetings, user surveys, public outreach comments, and infra structure considerations, that the Proposed Action at the site off Malae Point in North Kohala was the Preferred Location. The user survey and vessel survey have revealed that the proposed ocean lease site in Kohala experiences comparatively more limited use by the public, with a relatively low chance of finding a vessel in the proposed ocean lease site during the day. Also, proximity to Kawaihae Commercial Harbor was a strong determining factor in selecting the Preferred Location in North Kohala.

1.5.1 Alternative 2: Alternative OOA Site 2 – Keāhole Point

Project Location

The open ocean aquaculture site considered as Alternative OOA Site 2, and rejected as the Preferred Location, was off the North Kona Coast approximately three miles (2.6 nautical miles) due west of Keāhole Point (Figure 1-10). The land-based support for every day ocean operations, feed storage and feed transport to feed boats would still take place at Kawaihae Commercial Harbor (Figure 1-2) as described above for the Proposed Action. The Alternative OOA Site 2 is located outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS), shown in purple in Figure 1-10. 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.

Figure 1-10. Alternative OOA Site 2 Keāhole Point.

Map of the alternate Open Ocean Aquaculture (OOA) 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°43' 39.00" N 156°06' 30.00" W and the water depth is 5,800 feet (Map taken from NOAA HIHWNMS website).

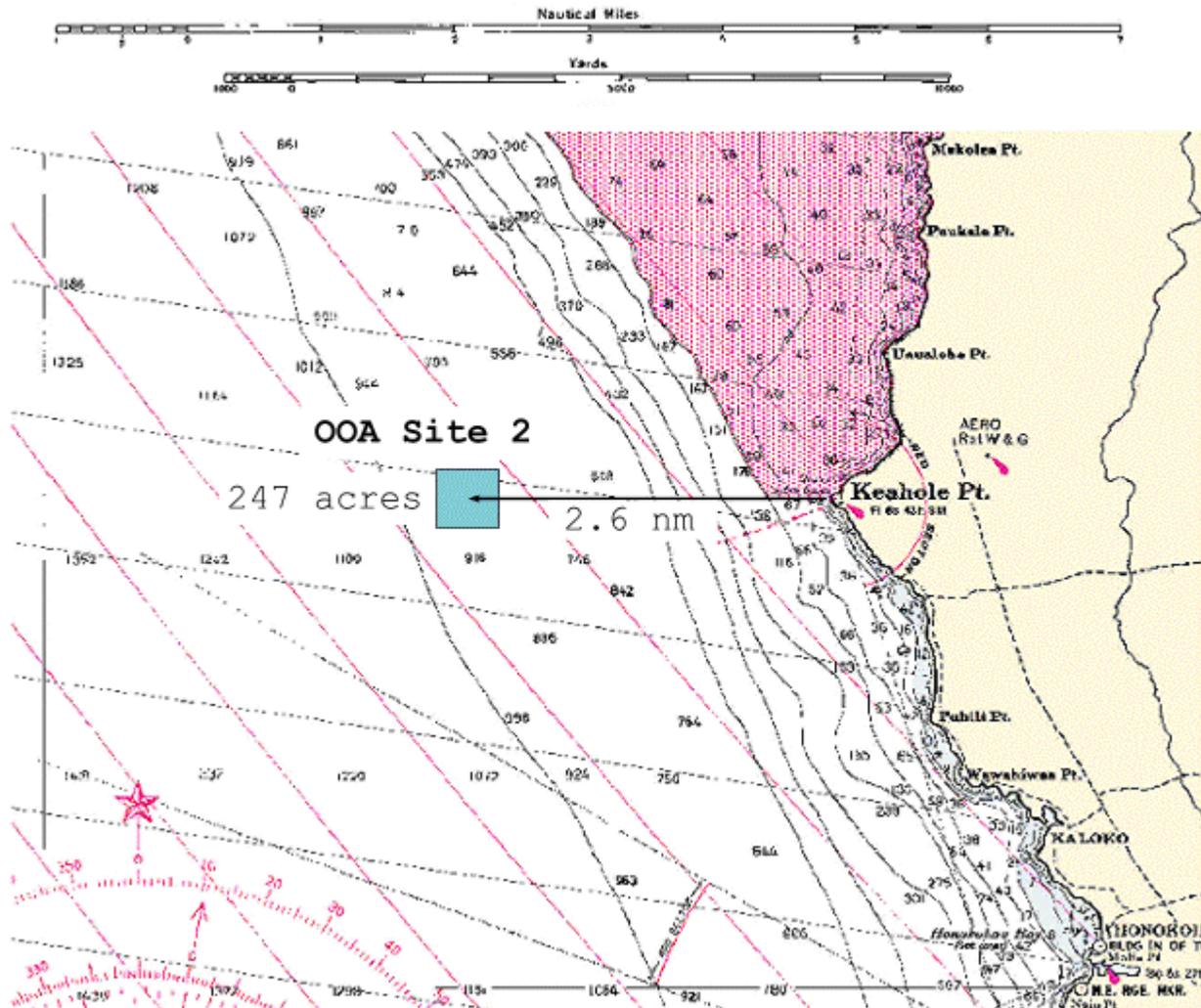
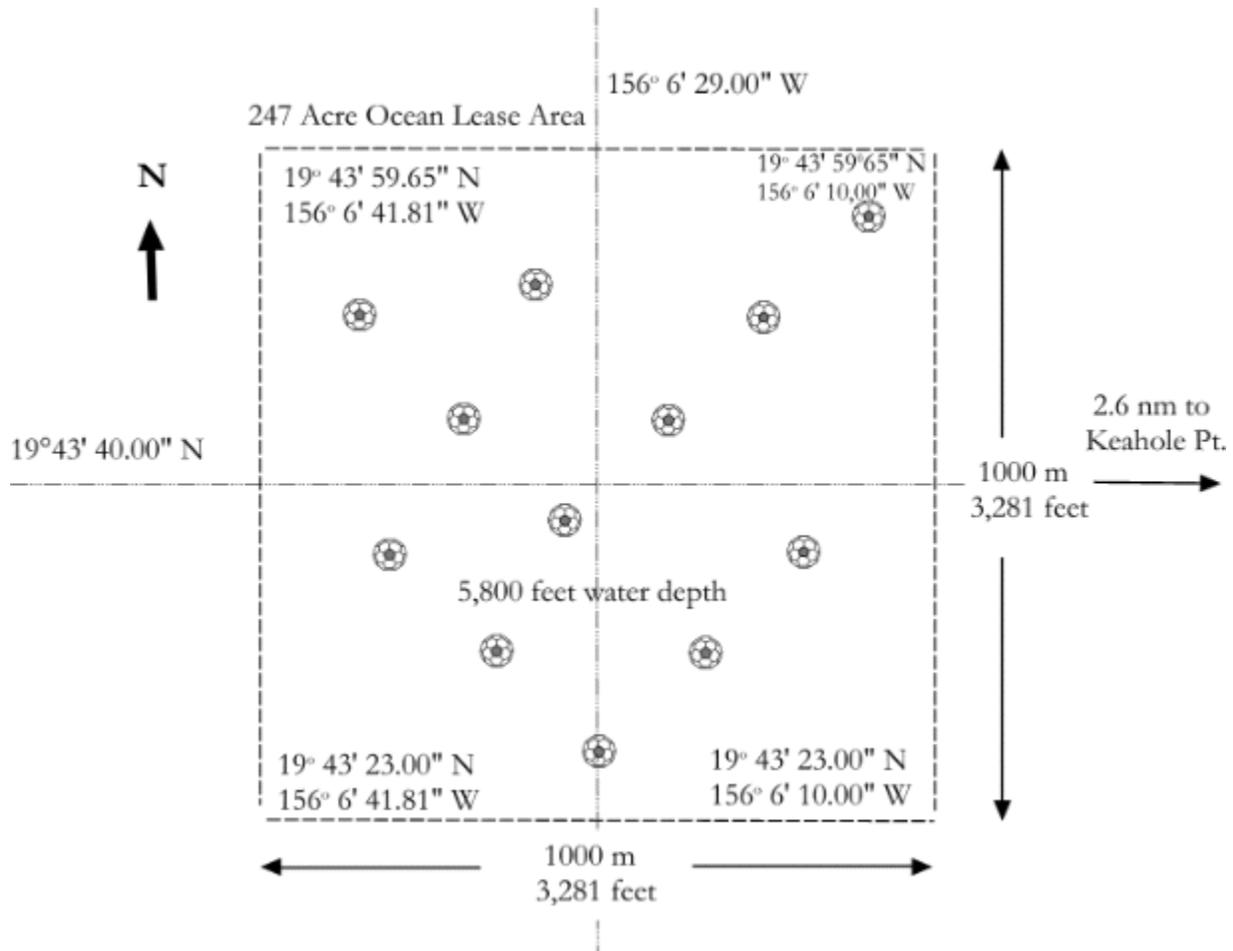


Figure 1-11. Map of Alternate OOA Site 2.

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



The Oceanspheres will be evenly distributed in the center of the 247-acre (1.0 square kilometers) site, as shown in Figure 1-11. Map of lease area centered at $19^{\circ} 43' 40.00''$ N $156^{\circ} 06' 29.00''$ W, with spacing of Oceanspheres within the ocean lease site to maximize mixing. The water depth at the site is 5,800 feet (1,768 meter); Oceanspheres 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.

Operations

Operations for Hawaii Oceanic Technology would be substantially different if the Alternative 2 site were utilized because the Alternative 2 site is significantly farther away from Kawaihae Harbor than Alternative 1 site. This greater distance would require substantially more fuel and time for the working vessels to reach the Alternative 2 ocean lease site.

Oceanspheres

The design of the Oceanspheres and their distribution within the leased area under Alternative 2 are the same as Alternative 1.

Feeding

Feeding methods and frequency for Alternative 2 are the same as Alternative 1. The greater distance of Alternative 2 site from Kawaihae Harbor would add to the time and cost of feeding operations, as compared with Alternative 1, the Proposed Action.

Oceansphere Maintenance and Tuna Health Inspections

The Oceansphere maintenance and tuna health inspections for Alternative 2 are the same as Alternative 1. However, the greater distance of Alternative 2 site from Kawaihae Harbor would increase time and costs for Oceansphere Maintenance and Tuna Health Inspections as compared with Alternative 1, the Proposed Action.

Harvesting

The harvesting procedures for Alternative 2 would be the same as Alternative 1. However, the greater distance from Kawaihae Harbor would add to the time and cost of feeding operations, as compared with Alternative 1, the Proposed Action.

1.5.2 Alternative 3: No Action

Under the no action alternative, Hawaii Oceanic Technology would not proceed with the development of the Ahi Aquaculture Project.

1.6 AGENCY AND PUBLIC PARTICIPATION

A scoping meeting was 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 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. A complete list of agency and public participants can be found in Figure 4-1.

1.7 REGULATORY FRAMEWORK

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). Coastal Zone Management Act, Marine Mammal Protection Act, Magnuson-Stevens Fishery Conservation and Management Act. Key provisions of these statutes and Executive Orders are described in more detail in later sections of this EIS, if necessary to better understand their application.

List of Needed Permits

1. US Army Corps of Engineers: Department of Army Permit under Section 10 of the Rivers and Harbors Act
2. US Coast Guard: Special Use Permit
3. DLNR/OCCL: State Conservation District Use Permit
4. DOH: National Pollution Discharge Elimination System Permit & Zone of Mixing Permit
5. DLNR/DOA: Aquaculture License
6. DBEDT – Office of Planning, Hawaii Coastal Zone Management Program: Federal Consistency Determination
7. County of Hawaii: SMA permit and building permit if the company is unable to lease an existing building and must make improvements to an undeveloped lot at Kawaihae Harbor for land base of operations.

CHAPTER 2

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

2.1 INTRODUCTION

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 alternatives and the projected environmental consequences of those alternatives. Only those environmental and socioeconomic conditions relevant to the proposed alternatives 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 describes the existing resources, methodology used for impact analysis, and factors used to determine the significance of impacts (HRS 343). 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. Following the summary description of

impacts in Section 2.1.3, Section 2.1.4 discusses whether the Ahi Aquaculture Project would contribute to cumulative impacts on the evaluated resources. Section 2.1.5 offers a more specific details in a summary of potential cumulative impacts on resources. Section 2.1.6 covers the relationship between local short term uses of the environment and long term productivity. Section 2.1.7 addresses irreversible or irretrievable commitment of resources. Section 2.1.8 discusses probably adverse impacts which cannot be avoided. Section 2.1.9 is a summary of recommended mitigation measures. And Section 2.1.10 is a summary of unresolved issues.

2.1.1 Environmental Consequences

This chapter evaluates the potential environmental impacts of the proposed action of the Ahi Aquaculture Project, the Alternative 2 site, and the no action alternative. This analysis includes likely beneficial and adverse impacts on the human environment, including short-term and long-term impacts, and direct and indirect impacts. The analysis of impacts on resources focuses on environmental issues in proportion to their potential effects. Detailed consideration is given to those resources that have a potential for environmental impacts. Interpretation of impacts in terms of their duration, intensity, and scale are provided where possible. Impacts under the no action alternative are compared against baseline effects of each resource discussed in Chapter 2.

Those conditions not affected by the Ahi Aquaculture Project were not discussed in this evaluation, including weather, climate change, global sea level change, atmospheric chemistry, air traffic, utilities, and public services (other than emergency services) as this project will have no impacts on these resources. None of the aspects of the proposed project will introduce additional needs or burden the current carrying capacity of the resources named above within the ROI. Hawaii Oceanic Technology's project design insures that its waste stream will become a viable input to sustainable livestock growth and renewable energy and will not produce green house gases or emissions that may induce changes in weather, climate, global sea level changes, or atmospheric chemistry. Shipping products via air freight will utilize existing air freight flights and will not affect the existing air traffic conditions.

2.1.2 Terminology

To determine whether an impact is significant, it is important to consider the context and intensity of potential impacts (HRS 343). Context normally refers to the setting, whether local or regional, and intensity refers to the severity and duration of the impact. Also, this EA includes a discussion of the possible conflicts between the Ahi Aquaculture Project and the objectives of state and local land use plans and policies for the area concerned (HRS 343).

Impacts are described by the following levels of significance:

- Significant impact;
- Significant impact but mitigable to less than significant;
- Less than significant impact;

- No impact; or
- Beneficial impact.

There may be both adverse and beneficial impacts within a single resource category; for instance, a project could interfere with a pre-existing land use such as recreation (an adverse impact), while expanding public access to different recreational resources (a beneficial impact). Where there are adverse and beneficial impacts, both are described. Mitigation is identified where it may reduce the significance of an impact.

2.1.3 Summary of Impacts

Beneficial impacts were identified for socioeconomic conditions. The Proposed Action and Alternative 2 will introduce new opportunities for economic growth and will increase employment opportunities from operational and support activities. No impacts have been identified for air quality, as the Proposed Action and Alternative 2 will not be altering the current resources and the air quality in Hawai'i is excellent and would not be substantially affected by this or any similar action. Less than significant impacts were identified for geology, sediments, soils and topography, land use and aesthetics, water quality, waste management, traffic, emergency services, and cultural resources. Minor impacts would occur as a result of increased use of facilities and resources. As with most actions, biological resources require sensitive and action-specific consideration and would be continuously monitored and given careful attention. The Proposed Action and Alternative 2, however, are not expected to cause a significant impact to biological resources.

Most cumulative impacts would occur independently of the proposed alternatives, and many could be mitigated to a less than significant level. The proposed alternatives would not, in any case, cause the significance level to rise above a less than significant status.

The no action alternative has been compared to the baseline conditions to equate what additional effects may result by implementing this alternative over the proposed action. This evaluation concluded that no impacts for any individual resource would be augmented by the execution of the no action alternative.

These impacts are discussed in the impacts evaluation included in this chapter, and where appropriate, mitigations are offered.

**Table 2.1-1
Summary of Potential Impacts of Implementing the Ahi Aquaculture Project Proposed Action,
Alternative 2, and the No Action Alternative**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action Alternative
Geology, Sediments, Soils and Topography	○	○	○	○
Land Use and Aesthetics	⊙	⊙	⊙	○
Ocean Use	⊙	⊙	⊙	○
Water Quality	⊙	⊙	⊙	○
Biological Resources	⊙	⊙	⊙	○
Waste Management	⊙	⊙	⊙	○
Traffic	⊙	⊙	⊙	○
Air Quality	○	○	⊙	○
Socioeconomics	○,+	○,+	○,+	○
Emergency Services	⊙	⊙	⊙	○
Cultural Resources	⊙	⊙	⊙	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. None of the significant impacts in the cumulative impacts column are attributable to the Ahi Aquaculture Project or no action.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

2.1.4 Cumulative Impacts Analysis

Cumulative impacts are the direct and indirect effects of a proposed project’s incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (HRS 343). For the purposes of this EA, the temporal boundary of analysis is from approximately 1998 to 2020. This boundary encompasses a range within which data are reasonably available and forecasts can be reasonably made.

The geographic boundaries of analysis vary, depending on the resource and potential effects. For most resources, the analysis area is characterized by the existing harbor facilities on Hawai’i and the off-shore marine environment, where much of the focus is on and where most activities would occur. Resources with further-reaching impacts, such as socioeconomics, are analyzed with a more regional perspective. The analysis area is described under each resource. Specific projects that are in proximity to the proposed ocean lease site, Kawaihae Commercial Harbor, Hilo Commercial Harbor, or are a comparable project in West Hawaii, which may have the potential to cumulatively affect the resources evaluated for the project are identified in Table 2.1-2, below. Some resources would be affected by several or all of the described activities, while others could be affected very little or not at all. The

2.1 Affected Environment and Environmental Consequences

2020 Harbor Master Plan (HDOT 1998) recommends the modifications listed in Table 2.1-2 be made to Hawai'i's harbors by 2020 (projects 1 through 33 below).

**Table 2.1-2
Cumulative Projects**

Project	Related Project Location & Description	Project Sponsor	Project Category
Cumulative Projects Potentially Occurring Within the Project Area			
1	Pier 1, Hilo Harbor with 20 acres	HDOT	Overseas container cargo terminal
2	Pier 3, Kawaihae Commercial Harbor with 21 acres of cargo yard	HDOT	Overseas container cargo terminal
3	Pier 4, Hilo Harbor with 21 acres of cargo yard	HDOT	Inter-island cargo terminal
4	Piers 5 and 6, Kawaihae Commercial Harbor with 22 acres of cargo yard	HDOT	Inter-island cargo terminal
5	Container berths at Pier 1, Hilo Harbor and Pier 3, Kawaihae Harbor	HDOT	Berths
6	Dry bulk cargo berths at Pier 1, Hilo Harbor and Piers 1, 2, and 5, Kawaihae Harbor	HDOT	Berths
7	Liquid bulk cargo berths at Pier 1, Hilo Harbor and Piers 2 and 5, Kawaihae Harbor	HDOT	Berths
8	Commercial fishing berths are provided at available piers and at Radio Bay, Hilo Harbor	HDOT	Berths
9	Passenger vessel (ferry, cruise ship, etc.) berths at Piers 1 and 5, Hilo Harbor and Pier 4, Kawaihae Harbor. Alternate berthing sites for passenger vessels in Hilo Harbor are at an extended Pier 2, a new pier at the northern end of Pier 1, and a new pier at Coconut Island	HDOT	Berths
10	Military cargo (including Coast Guard) berths at the existing Ro/Ro berth and Radio Bay, Hilo Harbor and the LST/LSV ramp and Pier 7, Kawaihae Harbor	HDOT	Berths
11	Research vessel berths at Pier 6 and Radio Bay, Hilo Harbor and Pier 4, Kawaihae Harbor	HDOT	Berths
12	Five access roads at Hilo Harbor	HDOT	Roadways
13	The eastern access road in Hilo may also serve as the Corps of Engineers' access to the breakwater	HDOT	Roadways
14	The improvement of all supporting roadways and intersections, including Kalaniana'ole Street, Kanoelehua Street, Silva Street, and Kawaihae Bypass Road	HDOT	Roadways
15	Because Kawaihae Harbor lands are adjacent to Kawaihae Road, access roads will be cognizant of local traffic constraints and will include the proper safety measures	HDOT	Roadways
16	Construct a primary passenger terminal at Pier 5, Hilo Harbor and an alternate terminal at Pier 4, Kawaihae Harbor; alternate sites for Hilo Harbor's passenger terminal are at Pier 1, Pier 2, and Coconut Island	HDOT	Passenger Terminal
17	Wave absorbers under Pier 1, Hilo Harbor to attenuate harbor surge	HDOT	Navigational Improvements
18	Dredging the area between Piers 3, 4, and 5, Hilo Harbor to a depth of 35 feet	HDOT	Navigational Improvements
19	Modifying the configuration or boundaries of Hilo Harbor's turning basin to permit construction or extension of piers	HDOT	Navigational Improvements
20	Dredging Kawaihae Harbor's turning basin to a depth of 40 feet	HDOT	Navigational Improvements
21	Forestry products (vener) require an acre of cargo yard at Hilo Harbor and six acres (wood chip operations) at Kawaihae Harbor	HDOT	Dry Bulk Cargo Terminal

**Table 2.1-2
Cumulative Projects**

Project	Related Project Location & Description	Project Sponsor	Project Category
Cumulative Projects Potentially Occurring Within the Project Area			
22	Bulk cement operation will occupy about an acre of Kawaihae harbor lands	HDOT	Dry Bulk Cargo Terminal
23	Scrap metal operations project a need for two acres of cargo yard at Kawaihae Harbor	HDOT	Dry Bulk Cargo Terminal
24	A public liquid bulk terminal is proposed at the coral stockpile, Kawaihae Harbor	HDOT	Liquid Bulk Cargo Terminal
25	Liquid bulk transfers are also possible at Piers 2 through 5, Kawaihae Harbor	HDOT	Liquid Bulk Cargo Terminal
26	In addition to the lands under their Executive Order in Kawaihae Harbor, the Army is provided 100 yards of beach access east of the LST/LSV ramp. The area west of the ramp is added to their jurisdiction for the Corps of Engineer's access to the breakwater	HDOT	Military Cargo
27	Pier 7, Kawaihae Harbor, will be constructed as berthing for Coast Guard vessels	HDOT	Military Cargo
28	The existing RO/RO berth in Hilo Harbor will also serve as a LST/LSV berth	HDOT	Military Cargo
29	Coast Guard vessels will utilize Radio Bay or Pier 6, Hilo Harbor.	HDOT	Military Cargo
30	Ocean research operations are permitted berthing for their vessels and adjacent landside accommodation at Pier 6, Hilo Harbor and Pier 4, Kawaihae Harbor	HDOT	Ocean Research
31	At Kawaihae Harbor, an area adjacent to both overseas and inter-island cargo terminals is delineated for cargo yard expansions as they become necessary	HDOT	Additional Recommendations
32	Kona Blue Water Farms (located about ½ mile offshore Unualoha Point, N. Kona)	Black Pearls, Inc.	Open Ocean Aquaculture

2.1.5 Summary of Cumulative Impacts on Resources

There are no significant cumulative impacts resulting from the proposed action (Ahi Aquaculture Project) that cannot be mitigated to less than significant impacts. Essentially, this is because the proposed action is relatively small in terms of numbers of people, setting of the project, and area affected. The predicted impacts of the proposed action either added nothing or affected a resource in only a minimal or negligible way.

This cumulative impacts analysis concludes with certain significant cumulative impacts solely because of the significant impacts of other past, present, and reasonably foreseeable future actions in Hawai'i. After analyzing the totality of the combined cumulative impacts, the preparers of this EIS determined that it is clear that the proposed action would not cause any less than significant impacts to become significant.

The limited nature of the Proposed Action, and Alternative 2 for purposes of cumulative impacts analysis includes the following factors. The Proposed Action and Alternative 2 would only take up one mooring space within Kawaihae Harbor, would not require improvements to harbor facilities, would not induce an influx of off-island personnel hiring, would not be altering the marine environment substantially, and would not interfere with fishing or marine commerce. Finally, the potential effects of the proposed action are limited

geographically; rather than occurring within the whole ROI, the effects are mainly restricted to the immediate vicinity of the open ocean aquaculture site and harbor facilities.

Some of the cumulative projects when combined with the Proposed Action or Alternative 2 would have a beneficial or complementary impact by improving fish supply to the market to help meet the high demand; in addition, employment, business sales, and income would increase from both the proposed action and other past, present, and reasonably foreseeable future actions, resulting in cumulatively beneficial effects on the ROI economy.

Geology, Sediments, Soils, and Topography

The Ahi Aquaculture Project would be situated in State waters, 3 miles (2.6 nautical miles) from shore, and there is only one other aquaculture project on the North Kona Coast, the Kona Blue Water Farm. The Kawaihae Commercial Harbor would not require improvements as a result of the proposed action.

The benthic environment on the West Hawaii Coast at depths below about 1200 m, consisted mainly of sandy silty carbonate muds and silty carbonate muds with occasional basaltic boulders. Above 1200 meters we began to see large boulders of limestone and mixed limestone basaltic breccias. Several vertical walls were observed between 1000 meters and 400 meters, some of them extending for 10's of meters and consisting of pillow basalts. Above 700 meters, nearly all limestone surfaces exhibited signs of extensive dissolution. (HURL, Quick Look Report Dive: PV-594, October 16, 2004). Deep corals occur throughout the U.S. Pacific but only the Hawaiian Archipelago and Line Islands have been the subject of any surveys. Coral habitat is patchy, suggesting at least a basic need for suitable bottom type and conditions of rapid flow. Surveys conducted off of Keahole Pt. were a mix of basalt and carbonate outcrops, and both supported *Gerardia* sp. and *C. lauunense*. Available surveys indicate coral beds dense with colonies that cover large areas are the exception (Parrish, 2007).

Given the minimal effects of the project, no cumulative impacts are anticipated to geology, sediments, soils, or topography. The geologic impacts discussed in Section 2.2 would be independent of, and would not affect or be affected by, other projects. No other cumulative geologic effects are expected to result from the Proposed Action and other projects. Refer to Section 2.2 for more information on geological resources in the area.

Land Use and Aesthetics

Analysis of the Proposed Action and its impact on coastal land use and aesthetics has included on-site observations, research of previous documentation of use, and interviews with coastal land owners, users, fishermen and boaters.

Use of the ocean in the proposed lease area is minimal. It is not an area specifically targeted for any fishery. However, it may be used by trolling boats transiting to offshore fishing areas to the southwest. From about September until April, bottom fishing is done in an area about one mile from the proposed ocean lease area. The proposed ocean lease site is at a depth of 220 fathoms (1,320 feet). Bottom fish fishermen have said they fish at a depth of about 130 -150 fathoms (780 – 900 feet). This year, opening of the bottom fishing season

has been delayed until November. Throughout the year, trollers will fish for mahimahi and ono about two miles away from the proposed ocean lease site, in a section of ocean parallel to the shoreline, at a depth of 25 – 30 fathoms (150 – 180 feet). From about August to January, `opelu fishermen will fish about 2 ½ miles away from the proposed ocean lease site at the numerous ko`a along the shoreline at a depth of 21 – 25 fathoms (130 - 150 feet). Affects of the Oceansphere as a fish aggregating device is discussed below under Biological Resources, and Cultural Resources.

Interviews with coastal land owners and long-time users indicated that the proposed project would not have any negative impacts on aesthetics or land use in the area. Reasons cited by the individuals included that the Oceanspheres would be submerged most of the time, that the Oceanspheres are three miles (2.6 nm) from shore, that the boats and surfaced Oceansphere is a similar use to the current use of the ocean area, and that the agricultural activity of aquaculture is consistent with the long-time ranching land use of the adjacent coastal land in that area.

The Proposed Action would not involve any construction at Kawaihae Harbor or Hilo Harbor, Impacts would be restricted to within the established harbor areas and leased boundaries and are consistent with existing land use plans. There would be no change in land use and therefore no incremental addition to land use impacts caused by the other past, present, and reasonably foreseeable future actions.

The Ahi Aquaculture Project would be the first aquaculture operation in this area, but it would not create any cumulative negative effects for land use and aesthetics. This EIS is an analysis of the proposed action at full scale build out, and includes an analysis of the cumulative impact of the proposed action with all other existing known open ocean aquaculture projects. But, this analysis does not attempt to characterize the carrying capacity of the entire regional ocean area for open ocean aquaculture in terms of land use or aesthetics. That is an important component of a regional planning effort for DLNR to conduct, which is beyond the scope of this EIS. Please see Section 2.3 for additional discussion on land use and aesthetics, and section 2.11 for additional information on Cultural Resources.

Water Quality

Since the proposed project's water quality Zone of Mixing model shows water quality parameters within state standards outside the Zone of Mixing, no cumulative impacts are anticipated from this project. Nonetheless, the issue of cumulative impacts may arise in consideration of any additional projects that may be proposed in the region. If this lease is issued, it will be the third such lease in the State. The Proposed Action site is located over twenty miles from the only other open ocean aquaculture operation in West Hawaii. The Alternative 2 site is located about 3 miles from the other operation. Both the Proposed Action site and the Alternative 2 site experience tremendous levels of flushing from the steady currents. Both of these sites are well removed from any habitat that would be sensitive to elevated nutrient concentrations should they occur. Existing open ocean aquaculture operations are considered in this analysis of cumulative impacts. However, no projections are made regarding any future additional aquaculture operations for this ocean

region, and no attempt is made to characterize the carrying capacity of this ocean region for open ocean aquaculture in terms of water quality. An aquaculture development plan will need to be developed that includes specifics about maximum recommended number of aquaculture operations in any given area and recommended distances between operating aquaculture farms in an area. This carrying capacity analysis is beyond the scope of this EIS for the proposed action, and is an important regional planning effort for DLNR to conduct. Ongoing water quality monitoring will be conducted as part of the NPDES requirements. The sampling protocols are discussed in Section 2.4

Biological Resources

Analysis of the proposed action and its impact on biological resources has included on-site observations, historical document research, analysis of marine resource management studies of the area, and interviews with fishermen and other boaters.

The Proposed Action site, located in waters 220 fathoms deep, 2.6 nautical miles from shore, is not in any area specifically targeted for fisheries. However, it may be used by trolling boats transiting to offshore fishing areas to the southwest. From about September until April, bottom fishing is done in an area about one mile from the proposed ocean lease area. The proposed ocean lease site is at a depth of 220 fathoms (1,320 feet). Bottom fish fishermen have said they fish at a depth of about 130 -150 fathoms (780 – 900 feet). In 2008, opening of the bottom fishing season was in November. The area designated as Habitat of Particular Concern, which is part of the Essential Fish Habitat for bottom fish is all seafloor between 21 fathoms to goes out to 918 feet depth (153 fathoms), which is about 400 feet shallower than the 1,320 feet (220 fathoms) depth of the proposed site.

Throughout the year, trollers will fish for mahimahi and ono about two miles away from the proposed ocean lease site, in a section of ocean parallel to the shoreline, at a depth of 25 – 30 fathoms (150 – 180 feet). From about August to January, `opelu fishermen will fish about 2 ½ miles away from the proposed ocean lease site at the numerous ko`a along the shoreline at a depth of 21 – 25 fathoms (130 - 150 feet).

At the Alternative 2 site (at 5,800 feet deep) located 2.6 nm west of Keahole Point, most fishing also occurs within 1- ½ miles from shore, and includes trolling parallel to shore and opelu fishing at specific ko`a fishing grounds. In addition, fishermen also report success trolling in waters at the 1,000 fathom contour line, which is located near the Alternative 2 site.

While there is some disagreement, fishermen interviewed for this analysis felt that proposed Oceanspheres would act as FADs and could affect the movement patterns of mahi and ono (target species for the trolling fishery), opelu, and bottom fish. However, most fishermen felt that the proposed site was too far away to have a significant effect on opelu. And since the proposed site is over 400 feet deeper than the official bottom fish “habitat area of particular concern,” then it could be argued that the site may be too deep to have an effect on bottom fish. Nonetheless, concerns were expressed by bottomfish fishermen that the Proposed Action may cause changes to the bottomfish fishery by attracting bottomfish away from their usual grounds. To evaluate this potential impact, the company conducted a Zone

of Mixing analysis (discussed in Sec. 2.4 on Water Quality) that indicated no feed or waste would make it to the bottom habitat of the bottomfish.

Fishermen report that in addition to the official state-sponsored FADs in the area, there are numerous illegal FADs deployed by private fishermen. It is also possible, as it relates to cumulative impacts, that more FADs occurring in a given area (i.e., existing FADs, illegal FADs, this proposed project, and any potential future OOA ventures) will diminish an individual FAD's impact. FADs do not increase the overall numbers of fish in the sea, and as such, more FADs may mean that fewer fish will be attracted to any single FAD. This is an interesting marine resource management research topic to investigate, but is beyond the scope of this EIS.

Based on the observations at the two ongoing open ocean aquaculture operations (i.e., Cates International, Inc. and Kona Blue Water Farms), the possibility exists that the Oceanspheres will act as Fish Aggregation Devices (FADs). Because the Proposed Action site and the Alternative 2 site are both located in very deep water compared to the Kona Blue Water Farms site, the Proposed Action and the Alternative 2 site will probably interact more with the pelagic ecosystem compared to the coastal, reef ecosystem in the vicinity of the KBWF cages. Any additional cumulative impacts remain speculative, as there is no evidence on the potential indirect effects caused by these Oceanspheres.

Based on this analysis, it is apparent that the potential effect of the proposed Oceanspheres as a FAD on the fisheries in the area around the proposed site is unknown. It could only be quantified once a Oceansphere is deployed and data gathered through periodic consultations with fishermen and DLNR. The company proposes to allow fishing close to the Oceanspheres so that local fishermen can benefit from any fish aggregating characteristics of the Oceanspheres. For safety concerns the company asks the public to please stay 100 feet (32 meters) away from the Oceansphere's surface buoy and to avoid fishing directly above or below the submerged Oceanspheres, and please no swimming, snorkeling, or SCUBA diving within the ocean lease area itself. The company proposes to continue on-going dialog with local fishermen to facilitate fishing close to the Oceanspheres, and to gather anecdotal information on changes in fishing trends.

The State of Hawai'i's Fisheries Assessment Program (State of Hawai'i 2007) lists four shark species (mako, silky, oceanic whitetip, and galapagos) as commonly caught species around their 57 FADs. To what extent these sharks and other species will be attracted to the Oceanspheres, is unknown. Nevertheless, sharks and other species are known to be habituated to places where food availability is established. Uneaten pellets, fecal material and growth on the Oceanspheres, will possibly provide an ecosystem that could attract predatory fish on a continuing basis. Interactions with sharks are managed through a specific shark management plan. The plan includes monitoring feedings, to reduce the release of feed into the ocean, using shark avoidance colors and patterns, shark resistant netting, and the daily practice of shark friendly diver/worker etiquette. The plan will be delivered to DLNR and be available at the worksite.

Dolphins, including bottlenose dolphins and spinner dolphins, may be attracted to the Oceanspheres also. A specific plan to manage interactions with the dolphins will include dolphin friendly practices and animal avoidance techniques. The plan will include monitoring feedings, to reduce the release of feed into the ocean, using marine mammal avoidance colors and patterns, resistant netting, and the daily practice of mammal friendly diver/worker etiquette. The plan will be delivered to DLNR and be available at the worksite.

Though the proposed ocean lease site is outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (which extends out to the 100 fathom contour), humpback whales may transit the site. Though no entanglement of whales have been reported for any anchored aquaculture cages, the design of the Oceanspheres without any loose hanging nets or anchor lines further minimizes the likelihood of entanglement. A whale interaction and management plan includes proper diver and worker etiquette. The plan will include monitoring feedings, to reduce the release of feed into the ocean, using marine mammal avoidance colors and patterns, resistant netting, and the daily practice of mammal friendly diver/worker etiquette. The plan will be delivered to DLNR and be available at the worksite.

Sea turtles may also transit the site. The lack of any loose hanging nets or anchor lines minimizes any potential for entanglement of sea turtles.

As part of these management efforts, the proposed activity will include ongoing monitoring and reporting of interactions with marine mammals, sharks and turtles as part of the management plans discussed above. Monitoring of potential impacts on fisheries could include ongoing interviews with local fishermen.

The concern by some about the potential for transfer of fish diseases from the proposed aquaculture operation to wild stocks was brought up in scoping meetings. Tuna health will be continuously monitored and the low stocking density and flushing of clean seawater will promote tuna health. If disease should occur the affected tuna will be removed from the Oceansphere.

Existing open ocean aquaculture operations are considered in this analysis of cumulative impacts on biological resources. However, no projections are made regarding any future additional aquaculture operations for this ocean region, and no attempt is made to characterize the carrying capacity of this ocean region for open ocean aquaculture in terms of water quality. An aquaculture development plan will need to be developed that includes specifics about maximum recommended number of aquaculture operations in any given area and recommended distances between operating aquaculture farms in an area. This carrying capacity analysis is beyond the scope of this EIS for the proposed action, and is an important regional planning effort for DLNR to conduct.

Waste Management

The fish will be processed by existing permitted fish processing companies in Kona or Hilo under contract to the company. Kona Fish Company has been contacted and is interested in

processing the tuna and shipping tuna to market. Each of these fish processing companies are fully permitted for their operations, including waste management. Hawaii Oceanic Technology plans to work with these fish processing companies to encourage that these fish byproducts be captured and used in the local cattle feed and nutraceutical industries as the waste products are a rich source of protein and omega 3 oils used to fight high cholesterol. The fish are processed at the fish processing facility and the fish offal will be kept and provided directly to the local cattle feed and nutraceutical industry. The proposed hatchery operation in Hilo at the PACRC is also operating under proper permits for management of its effluent. The PACRC is a research and development center at the University of Hawai'i at Hilo. Its mission is to advance long-term sustainable use and conservation of coastal areas worldwide through aquaculture and resource management.

Under the proposed action at the preferred Proposed Action site, or the Alternative #2 site, the Ahi Aquaculture Project would result in no cumulative impacts on waste management infrastructure within the ROI. However, cumulative projects overall would result in incremental adverse impacts to waste management resources in general. As the number of projects and developments and populations increases, the potential for exposure to and occurrence of hazardous materials and conditions is also expected to increase. The Proposed action site and the Alternative 2 site would contribute virtually nothing to the impacts of other actions, so there would be no increased cumulative impacts.

Traffic

There has been an increase in traffic on the Island of Hawai'i in recent years. Much of the increase in traffic is due to residential development north of Kona and increased tourism. As areas such as Waikoloa developed and people moved to these developing communities, commute traffic began to overload Queen Ka'ahumanu Highway in and out of north Kona. The Proposed Action site and the Alternative site would only affect the Kawaihae Harbor and Hilo roadways, which are not overloaded at this time according to the Hawaii Department of Transportation.

The individual projects listed on Table 2.1-2 would either have separate environmental assessment documents prepared or would not generate sufficient traffic to warrant a traffic impact analysis. Construction projects would, however, have impacts on traffic for the duration of each construction period. Harbor and harbor roadway improvement programs listed in Table 2.1-2 would result in a short-term adverse impact during the construction phases, but these projects would actually improve traffic conditions in the long term and would have a beneficial or complementary impact on public access by improving public roadways. These programs would serve as mitigation for additional harbor traffic and for commuters and tourists in the areas. In addition, there is currently a highway widening improvement project underway on Queen Ka'ahumanu Highway, immediately north of Kona, to address the existing traffic congestion occurrences in and out of north Kona.

The traffic impact analysis done for this EIS concluded that the proposed action would not contribute to the LOS decreasing on any roads in the Kawaihae or surrounding area, and would have a less than significant impact on traffic. The traffic impact analysis included the addition of employees vehicles, work trucks, and delivery trucks servicing the company's

land based operations center at Kawaihae Harbor, and took into account the planned roadway improvements to the area roads. The contribution to the cumulative effect on traffic by the Ahi Aquaculture Project would be minor. See section 2.7 on Traffic for discussion of the 2001 Traffic Study done for Kawaihae Harbor as part of the 2020 Master Plan, which analyzes future traffic levels. This analysis assumes a 200% increase in Kawaihae Harbor related traffic, part of which would include traffic from companies such as Hawaii Oceanic Technology that are leasing space in the Kawaihae Commercial Harbor. The analysis also assumes certain roadway improvements are completed. Based on these assumptions of growth and roadway improvements, the roadways are projected to operate at acceptable levels.

Air Quality

Emissions related to current levels of activities have not caused cumulative impacts, because air quality measurements on the island of Hawai'i indicate that levels of all pollutants are well below the ambient air quality standards.

Socioeconomics

The projects listed in Table 2.1-2 could combine with the proposed alternatives to produce significant cumulative effects on socioeconomics, but impacts would likely be beneficial. The Ahi Aquaculture Project would not likely result in an increase of school-aged children. The Ahi Aquaculture Project also would not result in an increase of off-island personnel, as future employees would likely be local residents and would not impact the local housing market or local school systems. However, with other projects that may promote population growth, there could possibly be cumulative effects on the schools of Hawai'i. Cumulative impacts to the schools (adding more students as a result of population growth) could be mitigated to less than significant with the corresponding increased tax revenue to fund education in Hawai'i. The additional tax revenue income to the state and County of Hawai'i from the multiplier effect of the Ahi Aquaculture Project and other cumulative projects may have a beneficial impact on the socioeconomics of Hawai'i.

Implementing the Ahi Aquaculture Project would result in small increases in employment, income, and sales volume in the ROI. Additional increases in employment, business sales, and income would also occur from other current actions and actions planned or proposed for the near future, resulting in cumulatively beneficial effects on the ROI economy.

HOT will primarily sell its tuna to the existing Japan and California markets, and therefore will not have an adverse effect on the local Ahi market.

The Proposed Action will only require the capture of about seven ahi each year to replenish the broodstock for the ahi spawning operation. This small number of captured fish would have no impact on the existing wild capture ahi fishery in Hawaii.

Emergency Services, Human Health and Safety

The demand for emergency services grows along with the general population growth in Hawai'i. The increasing population in the Kohala and Kona areas from past, present, and reasonably foreseeable future projects could potentially strain the capacity of emergency

services and facilities if service upgrades and staffing do not keep pace with population growth. Although these actions may individually have only a minor effect, together, if implementation of numerous projects were to exceed the service capacity of any of these the emergency services, expansion of emergency services resources would be necessary. The mitigation of emergency services expansion would reduce the impact to less than significant.

As described in Section 2.10, the Ahi Aquaculture Project would not likely have an impact and would contribute minimally to cumulative impacts. However, the incremental impact of proposed alternatives, when added to past, present, and reasonably foreseeable future projects, may be significant if unmitigated; however, mitigations such as increasing emergency services personnel and upgrading facilities would reduce the impacts to less than significant.

Cultural Resources

Since the first European contact, residential, commercial, and military development has destroyed or damaged many cultural resources. Those that remain, including any undiscovered sites, constitute an increasingly important source of information, and a cultural legacy passed down from the traditional and early post-Contact periods. Today, more is known about cultural resources and how to protect them from adverse impacts than was true in the early days of modern development. In light of past, present, and reasonably foreseeable future actions, the impacts of this and other projects on cultural resources are an important consideration and must be addressed.

As discussed above in the section under Biological Resources, the proposed site is not in any area specifically targeted for fisheries. It is located about two miles from the area targeted by trollers for ono and mahimahi on the 30 fathom contour line. It is located about two miles from areas targeted for opelu fishing. The site is located in deeper water further offshore from the area targeted for bottom fish, which is about 170 fathoms depth, located about one mile away from the site. Nonetheless, concerns were expressed by bottomfish fishermen that the Proposed Action may cause changes to the bottomfish fishery by attracting bottomfish away from their usual grounds. To evaluate this potential impact, the company conducted a Zone of Mixing analysis (discussed in Sec. 2.4 on Water Quality and Section 2.5 on Biological Resources) that indicated no feed or waste would make it to the bottom habitat of the bottomfish.

Also, there are no historic sites, areas of traditional importance or traditional cultural places in the proposed ocean lease site.

Interviews with coastal land owners and long-time users indicated that the proposed project would not have any negative impacts on aesthetics or land use in the area. Reasons cited by the individuals included that the Oceanspheres would be submerged most of the time, that the Oceanspheres are three miles (2.6 nm) from shore, that the boats and surfaced Oceanspheres is a similar use to the current use of the ocean area, and that the agricultural activity of aquaculture is consistent with the long-time ranching land use of the adjacent coastal land in that area.

All projects are subject to the requirements of the National Historic Preservation Act. As detailed in Section 2.11, the effects of the proposed action on cultural resources would result in no impacts on prehistoric and historic resources within the ROI. However, cumulative impacts of the proposed alternatives and other past, present, and reasonably foreseeable future actions may result in incremental adverse impacts to cultural resources and historic resources by allowing a higher level of development and activities.

Since cultural activities, beliefs and resources would not be changed or affected significantly under the proposed action, or in combination with other projects in the area, the potential cumulative impacts of the proposed action are deemed to be less than significant.

2.1.6 Relationship between Local Short-Term Uses of the Environment and Long-Term Productivity

The Oceansphere is a temporary structure and will be removed when it is not in use. Short-term damage to the environment relating to the Proposed Action and Alternative 2 would be limited. No significant impacts were identified that could not be mitigated to a less than significant level.

The long-term productivity of the environment will not be lessened by the Proposed Action as shown in the analysis in Section 2.4 on Water Quality and 2.5 on Biological Resources. Ongoing environmental monitoring will be done to ensure protection of the environment. Long term productivity of the open ocean aquaculture industry would be enhanced by the Proposed Action, which would help meet the high market demands of fish by providing a sustainable source of high quality, pure, clean tuna through open ocean aquaculture. The Proposed Action is designed to meet these production goals and enhance the quality of life and welfare of its staff and the quality of the natural environment.

2.1.7 Irreversible and irretrievable commitments of resources

HRS 343 requires an analysis of the extent to which the proposed project's primary and secondary effects would commit nonrenewable resources to uses that would be irretrievable to future generations.

Implementing one of the action alternatives would require committing both renewable and nonrenewable energy and material resources for open ocean aquaculture operations, such as the fuel used by vehicles and work boats; the increases in water, power, and other resources necessary to maintain and operate facilities for the new personnel; and the increase in local resources required to support the additional personnel and their families.

However, there will be no irreversible or irretrievable commitment of natural resources to this project since Chapter 190D HRS, as amended, specifically requires any lessee vacating an ocean lease to remove all equipment and to restore the site to its original condition. It has been the case with the two ocean leases granted to open ocean aquaculture operations in the state, the lessees are required to purchase comprehensive insurance for recovery and removal of any lost or damaged farm materials, and for any other damage that might be inflicted by the farm.

2.1.8 Probable adverse environmental impacts which cannot be avoided

There are no probable adverse impacts which are expected to occur with the Proposed Action. Any potential adverse impacts have been mitigated by the design of the aquaculture platforms without any mooring lines; and by locating the Proposed Action away from the nearshore waters where most fishers and boaters and other cultural activities are located, away from where spinner dolphins rest during the day, and away from the area within 100 fathom depth that is most frequented by humpback whales. While there is a recognition that the aquaculture platforms may attract fish to aggregate around them, this is viewed by some fishermen as a potential benefit, and viewed by some as a potential adverse impact. The potential impact will be mitigated by allowing the fishers to fish close to the aquaculture platforms, and thereby benefit directly from any fish aggregation that occurs at the Proposed Action site.

2.1.9 Summary of recommended mitigation measures

The design of the Oceanspheres without anchors allows for them to be sited in deep waters, far from shore, but still in State waters. This reduces the potential conflicts of use with other uses such as fishing and ocean recreation that occur closer to shore. The Proposed Action site was selected in part because there were no residential areas on the adjacent coastal lands.

Because of special concern expressed by fishermen that they be allowed to fish near the Oceanspheres, the company has decided to allow fishermen to fish adjacent to the Oceanspheres, just not above or below the platforms. Boaters are asked to stay 100' from the light and buoy attached to each Oceansphere. With this mitigation measure, local fishermen will be able to benefit from the Proposed Action.

To respond to the concern described by bottomfish fishermen about the potential effect of the open ocean aquaculture operation, best management practices will be used by the company to ensure no excess food or wastes are allowed to reach the bottom environment where the bottomfish are located. The Zone of Mixing analysis indicates that no food or waste would make it to the bottom in this 1,320 foot depth. The operation of the two other open ocean aquaculture shows no evidence of changes in the bottom environment at their depth of 200'. Therefore at 1,320' deep, the Proposed Action should not have an impact on the bottom fish population. See Section 2.4 and 2.5 for more details.

Additional mitigation measures will be practiced as described in the Shark Management Plan, Marine Mammal Management Plan and Endangered Species Management Plan. These plans will be developed in consultation with NMFS and DLNR, provided to DLNR and available for viewing at the worksite.

2.1.10 Summary of unresolved issues

There are no unresolved issues that have not been addressed in this DEIS through project design, operational protocols, best management practices and mitigation. There are pending permits that are not completed at this time.

2.2 GEOLOGY, SEDIMENTS, SOILS AND TOPOGRAPHY

2.2.1 Affected Environment

Introduction/Region of Influence

The Hawaii Oceanic Technology Ahi Aquaculture Project proposed site is approximately 3 miles (2.6 nautical miles) southwest of Malae Point (Figure 1-1) off the North Kohala coast. The Alternative #2 site that was considered, but not selected as the preferred site, is off the North Kona Coast approximately 3 miles (2.6 nautical miles) due west of Keāhole Point (Figure 1-10). Kawaihae Commercial Harbor (Figure 1-2) would serve as the fish feed transport location, the land-based support and the OOA daily operations boat deployment location. The use of Kawaihae would be restricted to existing facilities, thus the region of influence (ROI) for this resource would be limited to the ocean floor associated with the proposed ocean lease site and its immediate surrounding area.

Resource Overview

Geology of the Island of Hawai'i

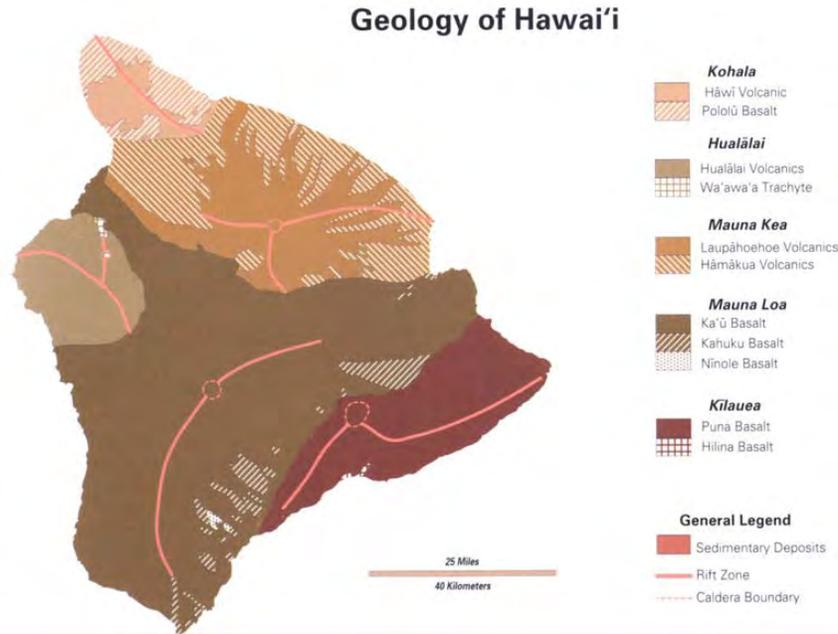
The Island of Hawai'i consists of five coalescent, subaerial volcanoes, an extinct submarine volcano, and Lōihi Seamount, a young active volcano that has not yet grown to sea level (Clague 1998; Figure 2.2-1). Hualalai is an active volcano in the postshield stage, with the most recent eruptions occurring 200 years ago, about 700 years ago, and three times between 900 and 1,200 years ago. It erupts alkalic basalt every few hundred years. Mauna Loa is nearing the end of the shield stage, so the volcano's frequency and rate of eruption are declining, although it still discharges lavas of tholeiitic basalt.

Ocean Sediments

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. Oceanic deposits are typically only apparent in deep-ocean basins and accumulate much slower than neritic deposits. Depending on conditions, the dominant deposit may be of lithogenous, biogenous, or hydrogenous origin. Oceanic deposits are further classified into two types, abyssal or oozes. Abyssal clay contains less than 30 percent biogenous particles and more than 70 percent lithogenous clay and oozes contain more than 30 percent biogenous particles by weight (Martin et al. 1991).

While it is suggested that about 98 percent of the sinking organic debris is degraded in the deep sea (Martin et al. 1991) and contributes little to deep-ocean sediments, marine organisms still make a significant contribution to many oceanic sediment deposits.

Figure 2.2-1 Geology of Hawai'i.



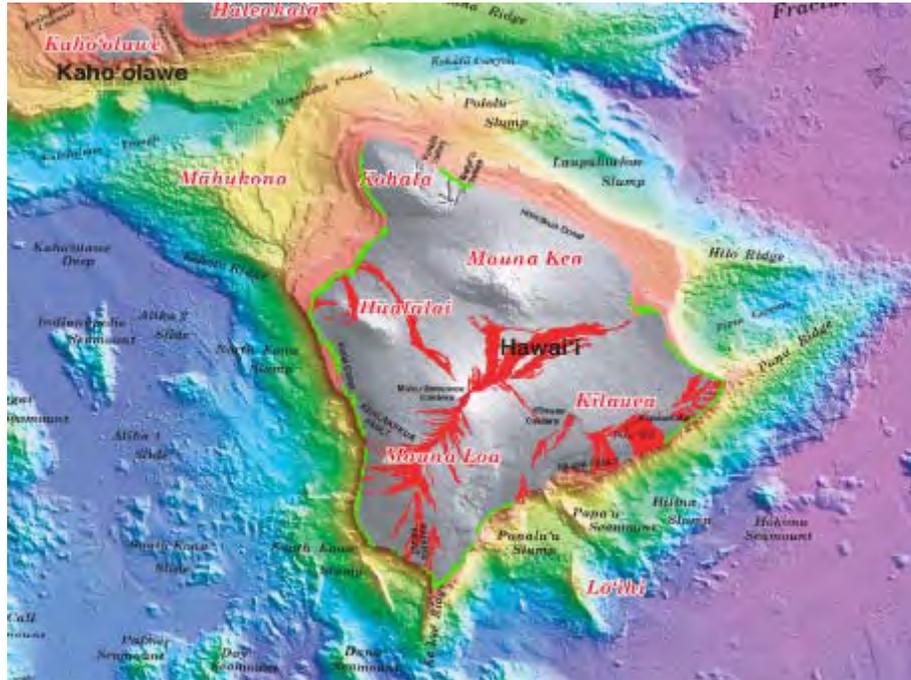
(Juvik and Juvik 1998)

It is common acceptance 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. An estimated 95 percent of the particulate carbon degrades by 3,000 meters below the ocean surface and only small quantities reach the sediments of the deep ocean (Suess 1980, Martin et al. 1987, Jahnke 1996). Significant rates of decomposition also continue in the sediments (Emerson et al. 1985, Cole et al. 1987, Bender et al. 1989, Smith 1992).

Seafloor Geology and Topography

The drop-off from the shoreline to deep oceanic waters off Malae Point and Keāhole Point is illustrated in Figure 2.2-2. At 5,000 feet (1,524 meters), in waters off North Kona and North Kohala, the bottom was low angle sediment with occasional basalt outcrops. At a depth of 2,625 feet (800 meters) there are more basalt flow features with sandy channels and corals. North of Keāhole Point, there are vertical carbonate walls with the tops being at depths of around 1,312 feet (400 meters) with large cottage sized carbonate blocks at the base. There are carbonate blocks on the slopes down from 1,640 feet (500 meters) and manganese coated carbonate blocks. The bottom at 800 meters and deeper is a steep sandy bottom with basalt and carbonate rubble and basalt outcrops and flow features. From depths of 4,921 feet (1500 meters) and beyond, the bottom is mostly barren low angle silt and clay bottom (Kerby 2007).

Figure 2.2-2. USGS Undersea Topography.



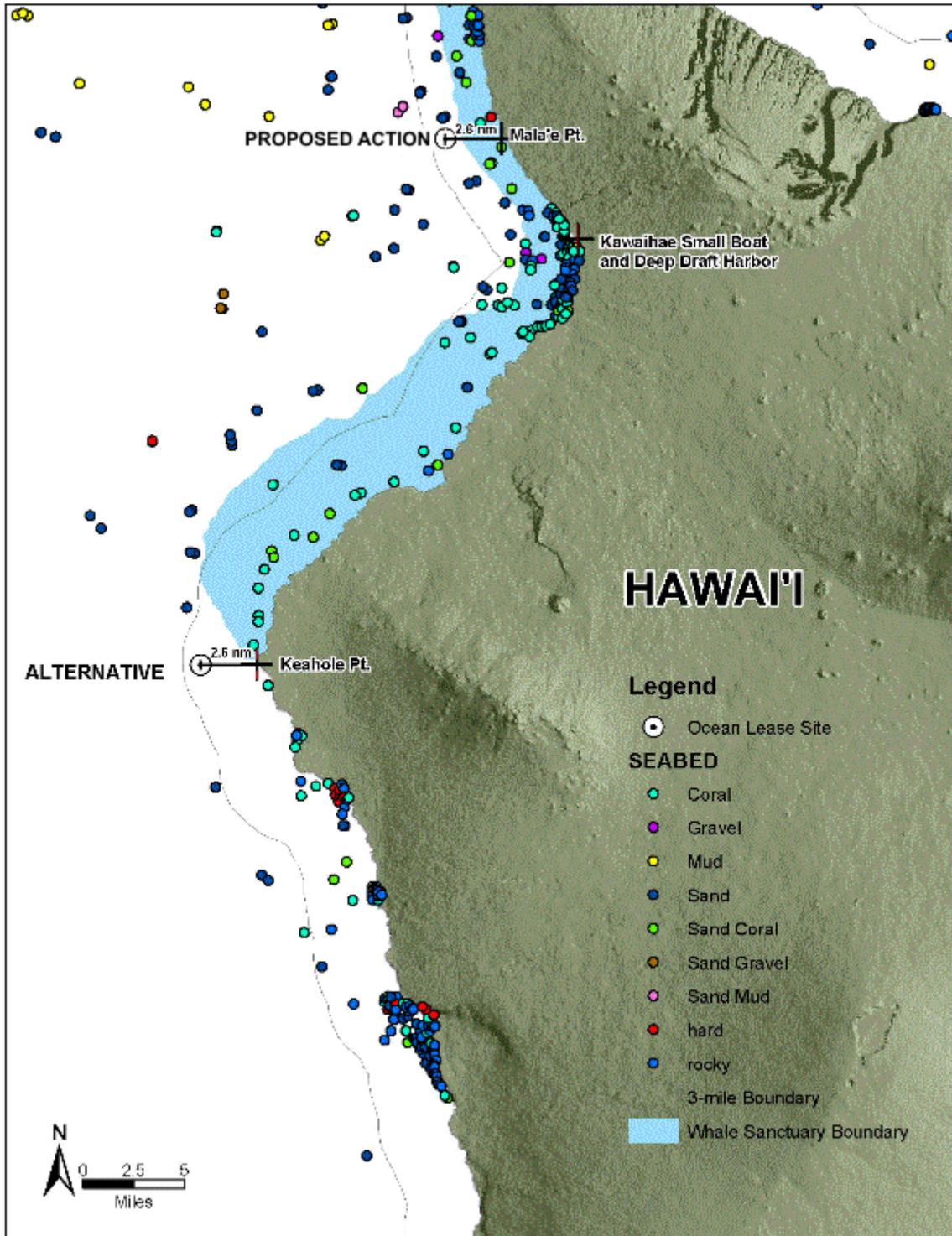
(Altonn 2003)

Efforts to map the seafloor and benthic habitats are underway by the National Seafloor Mapping and Benthic Habitat Studies Project (NSMBHSP). NSMBHSP strives to produce maps and geologic information that are useful for marine resource management. The project uses traditional data collected by the program, including sampling, bottom video, sidescan sonar, and multibeam sonar data. The project develops new methods of combining these data to produce habitat and surficial geology maps. The project maintains collaborations with NOAA, National Park Service (NPS), Minerals Management Service (MMS), United States Environmental Protection Agency (US EPA), Hawai'i Department of Education (HDOE), Department of Defense (DOD), other national and state agencies, and the biology and water disciplines of the United States Geological Survey (USGS) to obtain funding for multibeam mapping operations. Methods of classification and display of sonar, video, and possibly lidar data will be developed. Existing sampling data are compiled in usSEABED, a relational database of integrated quantitative data (KBWF 2003) on seabed texture, composition, and geophysical properties for the continental shelves of the US in conjunction with additional funding from the Marine Aggregates project. The areas off the Island of Hawai'i that have been mapped to date include the HIHWNMS between Maui and O'ahu and a small section off the coast of Hilo, but no conclusive data are available for the ROI of the proposed action.

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 2.2-3 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). The Hawaii Undersea Research Laboratory HURL Submersible Pisces Dive Reports described the bottom type in the Northern West Hawaii coast as rock (basalt), and although the site-specific seafloor geology classification of the subject site is not known at this time, the closest data point may indicate that the subject site may contain similar geology (rocky basalt bottom).

Figure 2.2-3. Seabed geology off the northwestern coast of the Island of Hawai'i (State of Hawai'i Office of Planning GIS Database 2007).



The State of Hawai'i Office of Planning GIS Database 2007 maps this area as being composed mostly of rocky substrate. The site is too deep for coral reef communities which depend on sunlight and precious coral communities are patchy in this area. Figure 2.2-4 is a photo taken of basalt substrate found on the slopes of Hawaii Volcanoes.

Figure 2.2-4 Photograph of pillow lava found on the slopes of Hawaii Island (Photo NURP).



2.2.2 Impact Analysis

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 proposed ocean lease site. Since there would be no need for harbor improvements under the proposed action, the primary impact analysis focuses on the proposed ocean lease site.

Factors Considered for Impacts Analysis

Factors considered in determining whether an alternative would have a significant impact on the existing geological, sediment, soil, or topographic conditions included 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.

Summary of Impacts

Table 2.2-1 summarizes geological, sediment, soil, and topographic impacts.

**Table 2.2-1
Summary of Potential Geological, Sediments, Soils, or Topographic Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Sediments and soils	○	○	○	○
Geological and topographic conditions	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ◐ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

Proposed Action – Malae Point

No Impact

The Proposed Action would use self-stabilizing technology to position the Oceanspheres, eliminating the need for anchors or other direct contact with the seafloor. This action would therefore have no impacts from Oceansphere placement, maintenance, and routine operations. Alternative 1 utilizes a self-contained and relatively self-sufficient technology for fish feeding operations. The feeders would be automated, with feed supplies replenished every two weeks. Feeders would dispense feed efficiently to maximize fish growth while minimizing feed waste; therefore, fish feeding operations would not likely contribute significantly to marine snow or to organic buildup on the seafloor. If instances of fugitive feed and fish debris occurred, it is probable that fish attracted to the Oceanspheres would consume the feed, that the feed would degrade and decompose rapidly, or that the feed would be taken out by the ocean currents, as would any fish excrement or other fish debris.

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.

Harbors would not require any modifications, as the two boats would be loaded onto trailers and stored at the Hawaii Oceanic Technology harbor facilities. No harbor or harbor facilities improvements are planned.

Since the proposed action would not likely contribute to any significant changes or buildup of organic or inorganic material on the seafloor, no anchoring of boats or Oceanspheres is permitted, and no changes to the harbors or facilities would be needed, no impacts to the geology, sediments, soils, or topography are anticipated.

Alternative 2 – Keāhole Point

No Impact

The Alternative 2 site is deeper than the Proposed Action site, but the benthic environment is similar. Because of this, impacts under Alternative 2 would be similar to those under the Proposed Action. The Oceanspheres would not be tethered, leaving the ocean floor untouched and the waste from feed, fish excrements or other fish debris would degrade and decompose rapidly, or be taken out by ocean currents, therefore minimizing marine snow and organic buildup on the seafloor. No harbor or harbor facilities improvements are planned. As a result, no impacts on the geology, sediments, soils or topography are anticipated under Alternative 2.

Alternative 3 - No Action Alternative

No Impact

Under the no action alternative, there would be no impacts, as no aquaculture project would be undertaken and existing conditions would not change.

2.3 LAND USE AND AESTHETICS

2.3.1 Affected Environment

Introduction/Region of Influence

The Proposed Action site for the Hawaii Oceanic Technology Ahi Aquaculture Project is off the North Kohala coast approximately 2.6 nautical miles, (4.2 km) due south west of Malae Point. An Alternative 2 site was considered, but not selected as the Proposed Action, located off the North Kona Coast approximately 3 miles (2.6 nautical miles) due west of Keāhole Point (Figure 1-1) in State waters. The land base for operations for either the Proposed Action site, or the Alternative 2 site, is leased land at Kawaihae Commercial Harbor (Figure 1-2). Therefore, the ROI for the entire operation is the project's proposed ocean lease area itself, as well as the leased land at Kawaihae Commercial Harbor.

Resource Overview

Land-Based Locations

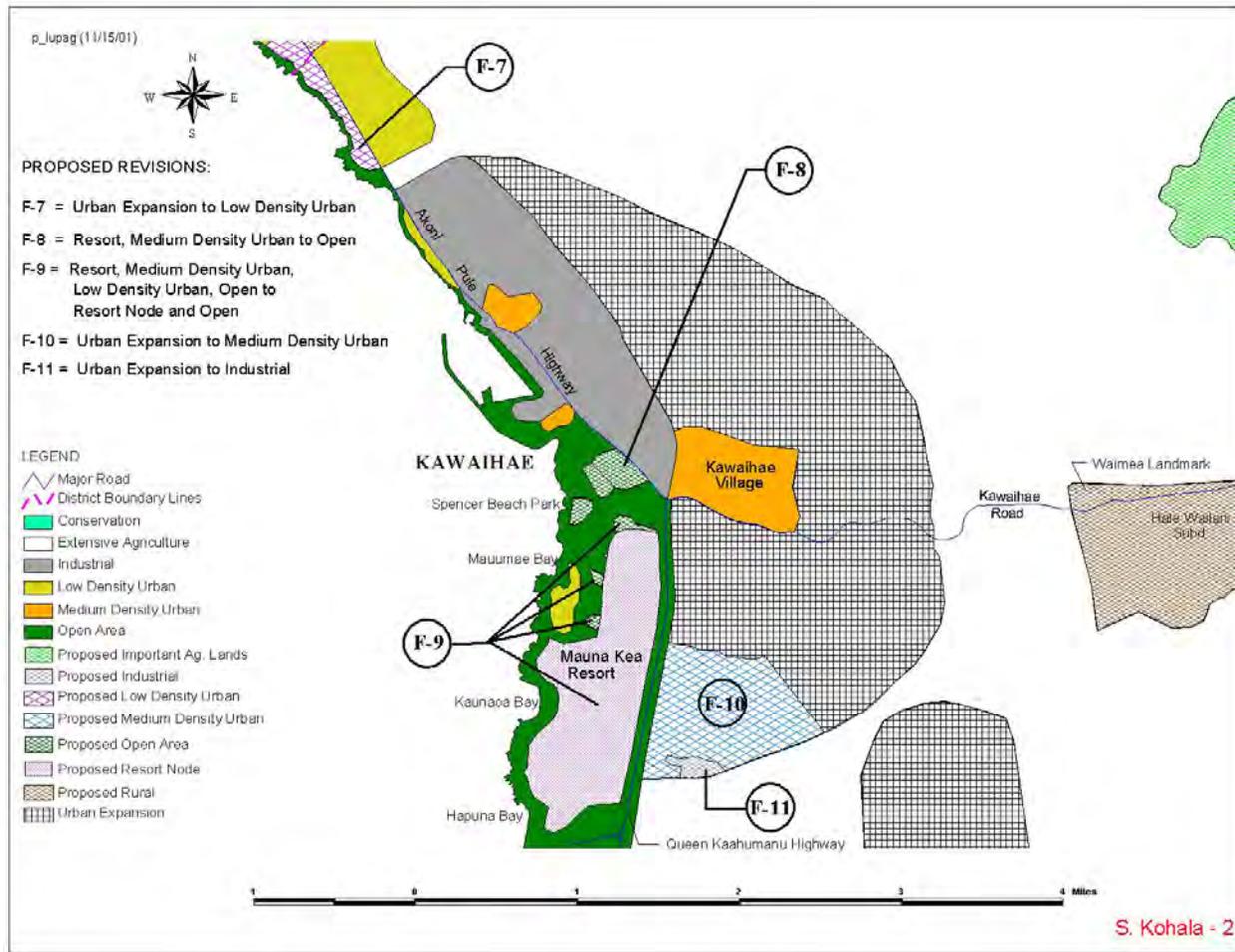
The Island of Hawai'i is served by two deep-draft commercial harbors. Hilo Harbor is the primary commercial port and is located at the eastern end of Kuhio Bay on the windward, or eastern, coast of the island. Kawaihae Commercial Harbor is located along the leeward, or western, coast of the island (HDOT 1998). Kawaihae Commercial Harbor will be used for feed storage, transportation, and the land-based support for ocean operations. Kawaihae Commercial Harbor will also be used for transporting fish to fish-packing and processing vendors in Kona. A transport vessel will use Hilo Harbor to transport hatchlings from the Hilo hatchery to the ocean lease site.

Kawaihae Bay (Latitude 20° 1' 59' N Longitude 155° 49' 43' W) is on the Island of Hawai'i's rocky northwestern coastline. Kawaihae Commercial Harbor is a manmade port, planned and constructed during the 1960s and 1970s on the northeastern side of the bay, located approximately 28 miles (45 kilometers) north of Kona airport. The harbor basin was constructed to be 1,050 feet (320 meters) wide, 1,750 feet (533 meters) long on the northeastern side, and 1,050 feet (320 meters) long on the southwest side (HDOT 1998). Kawaihae Commercial Harbor has 23 offshore moorings, two Tahiti-style moorings, a container loading area, a container lot, and a loading pier. The land use at Kawaihae Harbor is designated as industrial, with open areas associated with the breakwater (Figure 2.3-1). The proposed land use at the Kawaihae Commercial Harbor is consistent with designated land use of the area.

Submerged Lands

The site for the Proposed Action, and the Alternative 2 are both part of the ceded lands trust, since all submerged lands are ceded lands. The 1999 amendments to the Ocean and Submerged Lands Leasing law (Chapter 190D HRS) directly addressed the issue of the Office of Hawaiian Affairs (OHA) share of the lease revenues, by stipulating that 20 percent of lease payments should be due to OHA.

Figure 2.3-1. Land Use Designations for Kawaihae Commercial Harbor.



(County of Hawai'i 2005)

Open Ocean

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 center of the alternate ocean lease site located directly offshore of Keāhole Point is 19° 43' 39.00" N, 156° 06' 30.00" W and the water depth is 5,800 feet (1,765 meters).

Both the Malae Point and Keāhole Point areas are 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 Malae and Keāhole area are therefore significantly diminished over winter.

State Land Use classification for the Proposed Action ocean lease site and the Alternative 2 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.”

Aesthetics

The views from both Malae Point and Keāhole Point is of open ocean from a shoreline that has limited development. The waters of the Proposed Action Site and the Alternative 2 site are listed as Class A waters and are protected by the State for recreational use and aesthetic enjoyment. These views are valued by users of shoreline and near shore activities, including recreational diving and fishing along the near shore fringing reef and residents with homes overlooking the ocean. At the present time the views are largely unrestricted by development. The properties along the adjacent shoreline as Malae Point include open spaces, and ranch land. Land at the Kawaihae Commercial Harbor area are primarily industrial. The properties along the adjacent shoreline to the Alternative 2 site at Keāhole Point consist of Kona International Airport and the commercial aquaculture operations at National Energy Laboratory of Hawai'i Authority and the open ocean aquaculture operations of Kona Blue Water Farm (KBWF). Residential development is located in mauka lands in the Kona Palisades area.

Recreation

For the Proposed Action site and the Alternative site, ship based observations within the proposed site lasting a few hours and land based observational studies of over ten hour periods of observed vessels and users were performed using standard techniques typical of shore-based vessel and marine mammal surveys (see NOAA website <http://www.afsc.noaa.gov/NMML>). For the Proposed Action lease site, collectively 48 hours of observations on site were recorded representing 190 data points taken on the half hour in three districts of 1.) within lease area, 2.) within three miles of lease area and 3.) outside of three miles from lease site. Observations were conducted on three typical weekdays and a three typical weekend days at each site. In addition, observational studies over a greater than eight hour period were conducted at the Alternative 2 site over a typical weekday and weekend day and two boat-based observations were taken while the boat was on station for approximately one to two hours.

In addition to the observations, interviews were conducted of those fishermen who have fished this area the longest for `ōpelu, trolling for mahi and ono, and bottom fishing. (Please see Section 2.5 for more discussion on biological resources, and Section 2.11 for Cultural Resources)

Based on the observational data and the interviews with fishermen, the Proposed Action site is not in any area specifically targeted for fisheries. It is located about two miles from the area targeted by trollers for ono and mahimahi on the 30 fathom contour line. It is located about two miles from areas targeted for opelu fishing. The site is located in deeper water further offshore from the area targeted for bottom fish, which is about 170 fathoms depth, located about one mile away from the proposed site. At the Alternative #2 site, fishermen do report fishing the 1,000 fathom contour line, which is located close to the Alternative #2 site. This may result in some interactions with recreational fishers.

Malae Point had a maximum of 1.0 vessels inside of the ocean site per day at any one time, and had 12 vessels maximum at one time within three miles of the ocean lease site during an average day at any one time. Keahole Point had a maximum of 2.0 vessel inside of the ocean site at any one time per day, and had 8 vessels maximum within three miles of the ocean lease site during an average day at any one observation time (see appendix B). Boat observations of Marine Mammal activity, and marine biota were conducted on site by qualified whale watcher with NOAA, and a marine biologist from the USCG. A recreational use survey was conducted in August and September, 2007 regarding recreation use in the proposed project site area. Thirty eight users were surveyed, some by phone and others in person, and represented commercial SCUBA, snorkeling, and sailing operators; commercial and recreational fishers; and private individuals. Only eighteen percent of the respondents said that they operate along the Kohala Coast between Kawaihae Harbor and Hawi, the preferred alternative, and operate between 0 and 600 feet in depth. A little over five percent of the respondents say they regularly operate around XX buoy. Nearly eighty percent of the respondents did operate west of Keahole point, Alternative 2 site, and at depths up to 6,000 feet, and eighteen percent operate around buoy OT.

2.3.2 Impact Analysis

Environmental Consequences Impact Methodology

Impacts on land use and aesthetics were assessed based on whether the proposed activities were consistent with state and local land use and recreation plans and compatible with the surrounding land uses, as described in Section 2.2.

Factors Considered for Impacts Analysis

The evaluation of potential impacts on land use, including recreational resources, was 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)

Summary of Impacts

Table 2.3-1 summarizes impacts on land use and existing activities.

**Table 2.3-1
Summary of Potential Impacts on Land Use and Existing Activities**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Land use and existing activities	⊙	⊙	⊙	○
Recreation	⊙	⊙	⊙	○
Aesthetics	⊙	⊙	⊙	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

Proposed Action – Malae Point

Less Than Significant Impacts

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 HIIHWNMS area. The area proposed for leasing is ~~24720~~ acres (1.0 square kilometers) and will contain 12 platforms, when completely developed, which will produce ~~6,00042,000~~ tons (~~5,44310,886~~ 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 ~~24720~~ acre site, as shown in Figure 1-4. 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 OOA 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 ROI.

According to interviews with several native Hawaiian and kama`aina landowners and lessees of the adjacent coastal lands, there will be no impact on the visual aesthetics of the ocean and coastal land area due to proposed site's distance from shore, that the cages are submerged most of the time, that the work boats and tops of the cages will fit right in with

the other boat traffic in the area, that the navigation light is only visible two miles from the site, and that the coastal area is not used for residential purposes.

However, there may be an impact to recreation if the platforms act as fish attraction devices which may increase recreational fishing in the area. The impact is not considered significant because the proposed site is outside of any area targeted for fishery; it is outside of the area designated as Essential Fish Habitat for bottom fish or any other fish; the level of impact of the proposed action as a FAD is not predictable; area fishers have differing opinions about whether the impact as a FAD is beneficial or not; and the shore-based land owners and lessees said they didn't think there would be any impact on their visual or aesthetic resources. Allowing fishers to fish close to the platforms will potentially mitigate any impact that is caused. Ongoing dialog with local fishers and DLNR DAR will be used to monitor any changes to fishery patterns.

The recreation survey data indicated that recreation use along the portion of the coast by the Proposed Action site is small. Only eighteen percent of the respondents indicated that they operate in the area. In addition, the area is too deep for SCUBA diving. Based on these facts, and the data gathered from interviews with fishermen, it is determined that the impact to recreation at the proposed ocean lease site from the Proposed Action is expected to be less than significant.

Feed storage and feed transport will take place at Kawaihae Harbor. In support of these activities Hawaii Oceanic Technology will lease an existing commercial lot in the Kawaihae Commercial Harbor. The site will include the following:

- An office;
- A large fenced in area for storing OOA tools and equipment;
- A small communication station;
- SCUBA equipment storage; and
- An air compressor for SCUBA tanks.

Three large trucks and three large 35-foot (11-meter) work boats equipped with two 150 horsepower outboard engines each and trailers will be parked at the site. Additional boats will be contracted as needed from local fisherman and salvage companies. All of these activities are consistent with existing land uses, representing a less than significant activity, and one that would have less than significant impact on recreation in the Kawaihae Commercial Harbor area.

Alternative 2 – Keāhole Point

Less Than Significant Impacts

Impact under Alternative 2 will be similar to impacts under the Proposed Action. The proposed Alternative 2 site for the open ocean platforms is off the coast of the Island of Hawai'i at Keāhole Point. The platforms will be situated three miles (2.6 nautical miles) off

shore and will be outside the HIIHWNMS area. All of these activities are consistent with existing land uses, representing a less than significant activity. There will be no impact on the visual aesthetics of the ocean and coastal land area due to proposed site's distance from shore, that the cages are submerged most of the time, that the work boats and tops of the cages will fit right in with the other boat traffic in the area, that the navigation light is only visible two miles from the site, and that the coastal area is not used for residential purposes

Alternative 3 - No Action Alternative

No Impacts

Under the No Action Alternative, the current level of land use designations and plans or recreational use would not change, and the overall effect would be no impacts. There would be no changes to the visual resources, as no structures will be introduced on land or in the open ocean. Public access to the ROI would remain the same.

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 sites 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 sites for Alternatives 1 and 2 do 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).

2.4.1 Affected Environment

Introduction/Region of Influence

The ocean off the Kona and Kohala coast of the Island of Hawai'i is sheltered from the prevailing northeasterly trade winds by the 13,678-foot (4,169-meter) Mauna Loa and the 13,796-foot (4,205-meter) Mauna Kea, 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 and Kona 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 and Kona 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 Alternative 2 site is

located in deeper waters (5,800 feet vs. 1,320 feet). The Proposed Action site and the Alternative 2 site are 20 miles apart, but they are both 3 miles (2.6 nautical miles) from shore, 220 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.

Resource Overview

The business of open ocean aquaculture is relatively new to Hawai'i, with only two other operations in existence. One venture raises approximately 300,000 pounds (136,077 kilograms) of Pacific threadfin (moi, *Polydactylus sexfilis*) in four platforms situated 40 feet (12 meters) below the ocean surface in 120 feet (37 meters) of water, 2 miles (1.7 nautical miles) off the 'Ewa coast of O'ahu. The second venture raises approximately 250,000 pounds (113,398 kilograms) of Amberjack (*Seriola rivoliana*) in five nursery platforms which are submerged in 200 feet (61 meters) of water, 0.5 mile (0.8 kilometer) directly offshore from the Natural Energy Laboratory of Hawai'i Authority (NELHA) facility on the Kona Coast. The proposed project incorporates numerous technological characteristics that differentiate it from these other ventures, including the following:

- Operating 3 miles (2.6 nautical miles) offshore with the tops of the platforms at 65 feet (20 meters) below the surface in either 1,320 feet (402 meters) of water (Alternative 1) or 5,800 feet (1,768 meters) of water (Alternative 2);
- Using platforms that are not tethered to the sea floor;
- Drawing water from 540 feet (165 meters) below the surface to operate a hybrid Ocean Thermal Energy Conversion (OTEC) engine that will maintain the platforms in a geostatic position;
- Dynamic positioning system and propulsion systems that will position the Oceansphere in open ocean currents; and
- Ramping up in the first five years of operation to a maximum production of 6,000 tons (5,443 metric tonnes) of yellowfin and bigeye Ahi (*Thunnus albacares* and *T. obesus*) per year.

Because of these important differences, detailed oceanographic information on currents, persistent eddies, nutrient, and other depth profiles are provided in the following section.

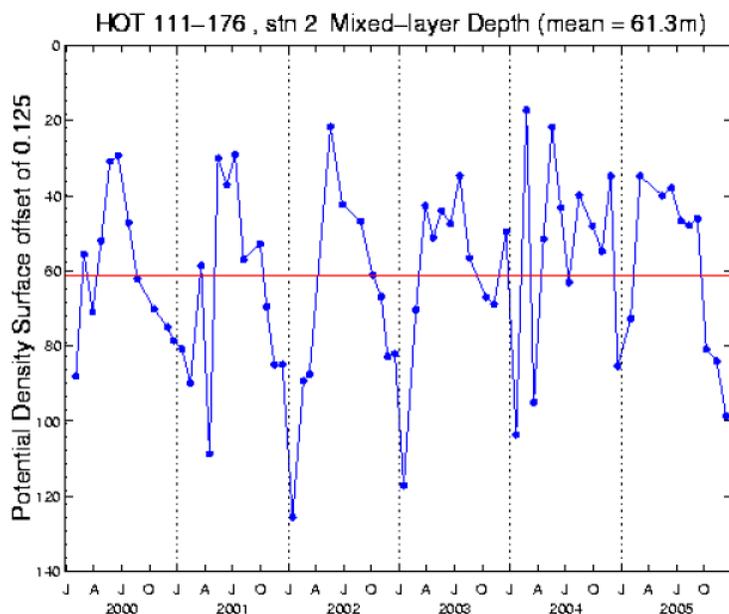
Oceanographic Conditions

Physical and Chemical Characteristics – Depth Profile

Near the surface, the water column is mixed by the wind and has uniform properties (e.g., temperature, salinity, and nutrient concentrations); the depth of this turbulent layer varies from nearly 400 feet (122 meters) in winter to less than 100 feet (30 meters) in summer (Figure 2.4-1). Below the surface mixed layer (SML), there is a sharp decrease in temperature,

from 77° Fahrenheit (25° Celsius) at the surface to 41° Fahrenheit (5° Celsius) at 2,297 feet (700 meters) depth (the thermocline).

Figure 2.4-1. Seasonal average of the surface mixed layer depth



Source: Hawai'i Ocean Time-series program, University of Hawai'i 2006

Hurricanes, El Niño, and extended periods of strong trade winds can cause the SML to deepen in the summer just as calm, unseasonably warm weather can lessen the SML in the winter, which accounts for the lack of seasonal bimodality in Figure 2.4-1. Properties of the water above and below the thermocline prevent mixing between them. As such, most dissolved nutrients and much of the particulate matter generated in the SML will not migrate to the water below, causing little impact on water quality of the deeper water.

The SML is also the zone of the ocean where solar radiation is strongest, primary production of phytoplankton is high, and the concentration of dissolved nutrients is lowest. Below the mixed layer, temperature and pH drop quickly, while nutrient concentrations increase dramatically from the near zero levels at the surface. “Island effects,” such as those that occur in the lee of the Island of Hawai'i, can reduce the SML depth (from diminished winds and current velocity) or increase the SML depth (from upwelling of water from persistent eddies). These effects shift the profiles but do not change their general pattern.

Baseline Water Quality Parameters

Table 2.4-1a and 2.4-1b provides relevant water quality parameters for samples taken at the center of the Malae Point site (20° 05' 40" N, 155° 55' 40" W, preferred alternative) and a control site (1 mi upcurrent from site). These data are the average of two samples taken at each site for the three designated depths and provide the baseline conditions for any future action and associated monitoring. The three depths correspond to 1) surface conditions, 2) approximate depth of cages, and 3) approximate depth from where colder water will be

drawn to operate the hybrid Ocean Thermal Energy Conversion (OTEC) engine. As can be seen in the table, the parameters remain basically uniform through the depth profile.

Table 2.4-1a
Water Quality Parameters at Proposed Action Site off Malae Point, Kohala (n=2)

	0-5 meters	50 meters	150 meters	EPA Method
Total Nitrogen ($\mu\text{g/L}$)	89	89	91	353.2
Ammonia Nitrogen (NH_4^+) ($\mu\text{g/L}$)	< 1	< 1	< 1	350
Nitrate + Nitrite ($\mu\text{g/L}$)	5	5	5	353.2
Orthophosphate ($\mu\text{g/L}$)	4	3	3	365.4
Total Phosphorous ($\mu\text{g/L}$)	14	14	14	365.2
Dissolved Oxygen (mg/L)	6.85	6.89	6.91	360.1
Turbidity (NTU)	.185	.193	.175	180.1
Ph	8.3	8.3	8.3	
Temperature ($^{\circ}\text{C}$)	27.7	28.0	27.3	
Salinity (ppt)	35.0	35.0	35.0	

Source: See note for Table 2.4-1b.

Table 2.4-1b
Water Quality Parameters at Control Site (n=2)

	0-5 meters	50 meters	150 meters	EPA Method
Total Nitrogen ($\mu\text{g/L}$)	90	99	90	353.2
Ammonia Nitrogen (NH_4^+) ($\mu\text{g/L}$)	< 1	< 1	< 1	350
Nitrate + Nitrite ($\mu\text{g/L}$)	6	5	5	353.2
Orthophosphate ($\mu\text{g/L}$)	3	3	3	365.4
Total Phosphorous ($\mu\text{g/L}$)	15	15	14	365.2
Dissolved Oxygen (mg/L)	6.85	6.83	6.87	360.1
Turbidity (NTU)	.175	.191	.165	180.1
pH	8.3	8.3	8.3	
CTD Temperature ($^{\circ}\text{C}$)	27.7	28.0	27.3	
Salinity	35.0	35.0	35.0	

Source: On site sampling on September 14, 2007, contracted by AECOS Labs. Surface samples were collected with a plastic bottle on a pole. Niskin bottles were used to sample at depth. Water temperature, pH and salinity were measured *in situ*. Duplicate samples were collected, tested at AECOS, Kailua-Kona, and the results were averaged. The control site is located one mile north of the Proposed Action site.

AECOS followed published EPA water quality analysis methods numbers 353.2, 350, 353.2, 365, 365.2, 360.1 and 180.1, and used standardized buffers to calibrate electrodes for *in-situ* pH, Temperature and Salinity. On site sampling was conducted on September 14, 2007, contracted by AECOS Labs. Surface samples were collected with a plastic bottle on a pole. Niskin bottles were used to sample at depth. Water temperature, pH and salinity were measured in situ. Duplicate samples were collected, tested at AECOS, Kailua-Kona, and the results were averaged. The control site is located one mile north of the Proposed Action site.

Other Water Quality Studies

The focus of the Hawaii Open-ocean Aquaculture Research Program (HOARP) (Ostrowski and Helsley 2003) included routine observations of water quality, health of the ecosystem outside the cages, interactions with protected species, and changes in the benthic assemblage were made to assess these potential impacts of open ocean aquaculture in tropical oceanic settings.

Observations over the past 6 years demonstrated that there was no measurable change to the water quality at the site. Observations of chlorophyll-a and turbidity suggest there was no important change in phytoplankton abundance near the cages, or that the change was so small that it could not be distinguished from the natural background variability.

Observations of environmental variables were made around a research site at the Cates International, Inc. offshore fish farm, about 3.22 km (2 miles) south of Ewa Beach, Oahu for 6 years. Initially, these were simply water quality measurements and assessment of changes in the micro-benthos beneath the cages and at control stations some 400 m up and down stream that were made as part of a set of proof-of-feasibility experiments. The research at the experimental site was transferred to the farm site in 2001 when the farm commenced operation.

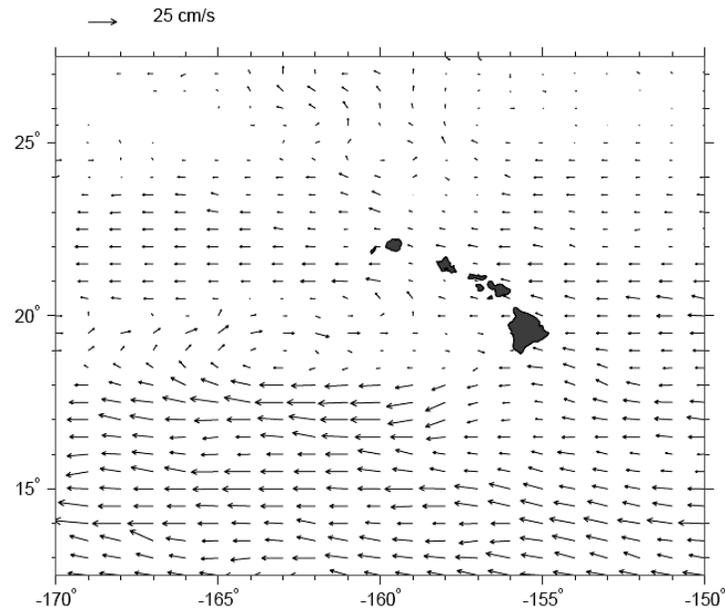
Other water quality data from the Kona region near Alternative 2 include a monitoring program conducted by the Water Quality Laboratory at the NELHA doing quarterly water quality sampling and analysis around Keāhole Point since 1989. While the Alternative 2 site is 3 miles (2.6 nautical miles) west from the NELHA monitoring area, the data provide a baseline to detect any changes in water quality in the groundwater or on the fringing reef from Ho‘ona Bay to Wawaloli. These data reflect the water quality in the Keāhole-Unualoha area. Kona Blue Water Farms also conducts water quality monitoring as part of their permit for the ocean lease near Unualoha Point.

Currents

Current speed is the primary factor in determining the proposed project’s impact on water quality, with higher speed generating more flushing and dilution of the nutrients generated. Current structure at the ocean lease site is described in detail in the Current Study Report.

Currents on the west shore of the Island of Hawai‘i, approximately 3 miles (2.6 nautical miles) off the coast, are generally one half to two knots (see appendix Current Study Report). Long-term current monitoring indicates a much slower average current speed. Figure 2.4-2, which is a 100-year average current speed around Hawai‘i based on 40,000 observations of ship drift, 85,000 observations of satellite-tracked drifting buoys, and 8,000 modern current measurements, indicates average speeds of less than 10 centimeters per second (0.2 knots). This is a large underestimate of actual instantaneous speeds, as the counterflow observations occurring at different times of the year will add up to an overall weaker current pattern.

Figure 2.4-2. Average Surface Flow



Source: Flament 1996 (25 cm/s ~ 0.5 knot)

This on-site observation is confirmed by observations at NELHA noting that currents along the Kona Coast run from south to north. These currents are deflected by Keāhole Point, and a gyre (circular current) develops to the north of Keāhole Point. Authoritative current data are only available for the Keāhole Point area from a monitoring program conducted by the Look Laboratory of Oceanographic Engineering in 1979, to provide engineering information for deployment of OTEC.

Physical processes that contribute to the mean and variable flow in the region include the wind stress and its space-time distribution, tidal motions, and eddies. The long-term average surface currents in this general region are weak, ~10 cm/s towards the west (Lumpkin and Flament, 2001), but the actual currents at any particular time are often relatively strong (50 cm/s or more) and variable in direction because the region is dominated by eddies (Patzert, 1969; Lumpkin, 1998). The variance of sea level observed from satellite altimeters clearly shows that the region west of Hawaii Island is subject to strong variability (Calil et al., 2008).

Current measurements are available for the region west of Hawaii from OTEC environmental studies during the 1980s, from satellite-tracked surface drifters, and from shipboard during the recent E-Flux program. In addition, the Navy operational ocean analysis system combines the HyCOM (Hybrid Coordinate Ocean Model; Hurlburt et al., 2008) with ocean and atmospheric observations to estimate the state of the global ocean at very high (8 km) resolution.

Moored current measurements at the HOTECH-1 location were made by Edward Noda and Associates from December 1980 to April 1981. The water depth at this location is 1341 m. Currents were measured at depths of 54, 101, 151, 363, 771 m. This record is too short to establish the mean flow; however it demonstrates the variability of flows that affect this area.

The current speed was rarely less than 10 cm/s. During the first half of the record, typical speeds were 20 cm/s with frequent increases to 40 cm/s. An event with maximum speeds of more than 80 cm/s towards the north occurred over a 20 day interval in the middle of the record. As the currents weakened, they veered towards the west and then southward. This was likely due to an anticyclonic eddy that formed close to, but north of the site and then propagated westward.

Water Quality Model

Hawai'i Administrative Rules (HAR 11-54) state that all waters will be free of substances that are attributable to domestic pollutants, industrial pollutants, or other sources of pollution and it sets limits for effluent discharge. The OOA site is classified as oceanic waters. In order to estimate the effects on water quality of the proposed aquaculture operation, a zone of mixing model was constructed for a 247-acre (1-square kilometer) area and a 492-foot- (150-meter-) deep operating volume. Published nitrogen and phosphorus discharge rates vary based on operational design, species raised, and types of feed. Empirically derived discharge rates from select authors for marine finfish which were fed pellets and cultured in platforms in the environment vary between 25 and 104 Kg Nitrogen per tonne of fish produced and 7 to 18 Kg Phosphorus/ tonne of fish (Brooks and Mahnken 2003; Enell 1995; Glencross 2003; Lupatsch and Kissil 1998). The collective average discharge rates from these studies of 65 Kg/tonne nitrogen discharge and 9 Kg/ tonne phosphorus, were adapted for the water quality model. Total Suspended Solids (TSS) was modeled as Feed Conversion Ratios of 15 percent uneaten and 17 percent of eaten feed in fecal production. Peak production will be 6,000 tons (5,443 metric tonnes) of Ahi per year, in a 0.2 knot current (worst case scenario), which is half the speed of the measured mean ocean current over a four month current meter deployment (see appendix Current Study Report), the following modeled excess of nutrients will be added to the surrounding seawater at the edge of the zone of mixing (Table 2.4-2). State of Hawai'i water quality standards are provided to compare to nutrients added during modeled fully operational farming activities. Faster currents will provide for lower concentration of effluents due to the effects of dilution with clean ocean waters.

**Table 2.4-2
Comparison of State Standards with Modeled Farming Activity Effluent**

	State of Hawai'i Standard ¹	Modeled ZOM ³ Effluent Excess at 0.2 knot current
Total Nitrogen (µg/L)	50.00	0.52
Ammonia Nitrogen (µg/L)	1.0	Less than 0.52
Nitrate + Nitrite (µg/L)	1.5	Less than 0.52
Total Phosphorous (µg/L)	10.00	0.06
Turbidity (NTU ²)	0.03	-
Total Suspended Solids (mg/ L)	-	0.0065

¹ Standard concentration is the allowable limit listed in HAR Ch. 11-54-06 (c)(3) "Oceanic waters."

² Nephelometric Turbidity Units

³ ZOM = Zone of Mixing

TSS are modeled as mass; however, the Hawai'i standards are in Nephelometric Turbidity Units (NTU), which are based on the scattering properties of light. Based on long-term

monitoring data by NELHA for inshore waters, turbidity is very low and there are negligible levels of particulate matter. Turbidity values along the cross-reef transect at the tip of Keāhole Point range from 0.10 NTU at the surface to 0.14 NTU at the bottom.

2.4.2 Environmental Impacts

Impact Assessment Methodology

While marine aquaculture has a long history across the world (e.g., salmon pens, oysters farms) and in Hawai'i (e.g., fish ponds), with many peer-reviewed scientific environmental impact analyses available in the literature, OOA is a more recent phenomenon, with less scientific literature to draw upon. The few studies that are available come from an initial set of pilot studies (Hawai'i Offshore Aquaculture Research Project, phase I and II) conducted by the University of Hawai'i and Oceanic Institute and the monitoring of the two existing OOA operations ongoing in Hawai'i (Cates International, Inc. [CII] moi platforms and Kona Blue Water Farm [KBWF] kampachi) for compliance with state and federal water quality standards. Given the limited available research to reference, the growth of this industry must be closely monitored in a systematic way, such that these questions can be definitively answered for these and future operations.

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, OOA 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 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.

Summary of Impacts

Table 2.4-3 summarizes impacts on water quality.

Table 2.4-3
Summary of Potential Water Quality Impacts

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Deterioration of water quality down current of farm	⊙	⊙	⊙	○
Accumulation of fish feces under platforms or on downstream reefs	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table.

LEGEND:

⊗ = Significant impact	+ = Beneficial impact
⊙ = Significant but mitigable to less than significant impact	N/A = Not applicable
⊕ = Less than significant impact	
○ = No impact	

Proposed Action – Malae Point

Less than Significant Impacts

Deterioration of water quality down current of farm. Based on the water quality model and water quality data collected on September 14, 2007 from surface, 50 meters and 150 meters at both the center of the preferred site and 1 mile upcurrent from the site, leads to the conclusion that there will be little impact to water quality. Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentration around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes' metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (see appendix Current Study Report), constant mixing of the SML, placement of platforms at 180 feet (55 meters) depth, 3-mile (2.6-nautical mile) distance from coral reefs and 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.

The best examples of likely impacts on water quality are drawn from the studies of the OOA research projects and water quality monitoring from the subsequent commercial moi operation off 'Ewa Beach, O'ahu, (CII) as well as the water quality monitoring program of the cages 0.5 mile offshore of Keāhole Point for KBWF (KBWF 2003). The broad conclusions drawn from these studies are that the tremendous dilution factor of the water moving through these deep-water OOA platforms greatly reduces the impacts on the water quality downstream of the operation.

Studies from the 'Ewa Beach site found that there was an increase in ammonia levels directly downstream from the platform after the first feeding of the day, but that, in most instances, this was quickly mixed and absorbed by naturally occurring bacteria and phytoplankton (KBWF 2003). Values reached ambient levels (comparable with control sites) within 99 feet (30 meters) downstream from the cage. In addition, TSS showed no discernible trends or changes. Any fluctuations that were evident may well have been caused by high surf or strong currents, rather than from any impact of the fish cage. The depth of the water and distance from land for this project would remove the possibility of this confounding factor.

In contrast to the Cates International operation on O'ahu, the KBWF operation is the most similar to the Proposed Action site and Alternative 2 site. As such, the data from the KBWF monitoring stations are described here to convey the potential impact from the proposed action (data are available at KBWF 2006). For each parameter, the state water quality standards are provided for Class A oceanic waters, where the Proposed Action site and Alternative 2 site are located. Please note that the water quality data from the KBWF site should not be compared directly with the listed state standards, as these standards are specific to the oceanic waters of the Proposed Action site and Alternative 2 site, and not the nearshore waters of the Kona coast.

Two KBWF monitoring stations are at the ZOM boundary upstream of the prevailing current (control stations), one is immediately downstream of the platform with the highest biomass (effluent station), and four are at the ZOM boundary downstream of the prevailing current (compliance stations). All stations are sampled at the surface, midwater (same depth as the platforms – 50 feet [15 meters]), and bottom. Samples are taken one hour after feeding. Control and compliance stations are switched in the event of a reversal of the prevailing current.

Turbidity. The overall pattern of the KBWF water quality data is one of occasional, marginal increases in turbidity at the midwater effluent station, compared with other depths and stations. The latest available data (June 2006) show control readings between 0.2 and 0.35 NTU, compliance readings between 0.14 and 0.3 NTU, and effluent readings between 0.21 and 0.3 NTU. The state minimum water quality standard is 0.03 NTU (geometric mean) for Class A oceanic waters.

Ammonia. The overall pattern of the KBWF water quality data is one of no discernible difference in levels of ammonia between the two control stations, the effluent station, and the four compliance stations. The latest available data (June 2006) show control readings of 0.5 µg/L, compliance readings between 0.5 and 2.0 µg/L, and effluent readings of 0.5 µg/L. The state minimum water quality standard is 1.00 µg/L (geometric mean) for Class A oceanic waters.

Nitrogen. The overall pattern of the KBWF water quality data is one of no discernible difference in levels of total nitrogen between the two control stations, the effluent station, and the four compliance stations. The latest available data (June 2006) show control readings between 93 and 139 µg/L, compliance readings between 105 and 125 µg/L, and effluent

readings between 118 and 125 µg/L. The state minimum water quality standard is 50.00 µg/L (geometric mean) for Class A oceanic waters.

While the Proposed Action is to produce as much as ~~twelve~~^{forty-six} times more fish than the current KBWF production, this increase will occur gradually over five years. During this period, a water quality monitoring program, required for the NPDES permit, will be ongoing. Potential increases in concentrations of required monitoring parameters as production increases will most likely be gradual. If pre-determined limits of any of these parameters are approached, production will level off, so as not to lose the necessary permit. A detailed description and requirements of the NPDES permit process is discussed below under Monitoring Program.

Given the distance from land and depth of water, the strict standards for water quality for oceanic waters, the high volume of water moving through the site quickly diluting excess nutrients, and the high variability of natural concentrations of nutrients due to cyclonic eddies (see Current Study Report), the proposed project is expected to have a less than significant impact on water quality in the ROI.

No Impacts

Accumulation of fish feces under platforms or on downstream reefs. Concerns raised during public meetings for KBWF's open ocean leasing process indicated misperceptions about the potential for fish food or fish feces to wash up on the beaches. Additional concerns were expressed over the impact of the benthic habitat from food and feces directly under the platforms. Fish feces are primarily composed of liquid material and are quickly dispersed. Feces from fish such as mahimahi, tunas, and jacks are not composed of discrete stools, are not odiferous, and do not carry bacteria or other microbes that may be potentially pathogenic to humans. Any solids in the fish feces are negatively buoyant and descend in the water column. Carnivorous fish have highly efficient digestive systems, while herbivores are highly inefficient. Most divers are familiar with the prodigious streams of feces that are frequently emitted by parrotfish (uhu, Family *Scaridae*) or surgeonfish (palani, maiko, etc. [Family *Acanthuridae*]), yet few recall seeing feces from carnivorous fish. Similarly, most fishermen also recognize the difference in large-intestine volume between herbivorous and carnivorous fish.

Most fish feeds are designed to sink gradually through the water column. Feed that falls uneaten through the platform will likely be eaten by the wild fish around the platform. There is only a remote possibility that any food missed by several species of wild fish would reach the seafloor in the proposed operation, as it would need to travel 1,320 feet (402 meters) in increasingly denser water. Vertical movement would ultimately slow or even stop, while the weak cross currents would disperse the particulate matter until it is consumed by mid-water fishes or bacteria. Finally, any feed that is not eaten by the fish represents a waste of money. Prudent management practices decree that feed wastage be minimized. This will be accomplished by multiple feedings per day by the automated feeders attached to the platforms and a program of monitoring the consumption rates of the fish to determine the point of satiation for the size of fish and density in individual platforms.

Given the less than significant impacts on the benthic habitat for the Cates International, Inc. (CII) operation and the Kona Blue Water Farms (KBWF) operation, in conjunction with the depth of the water and distance from land at the Proposed Action site and the Alternative 2 site, no impacts on the benthic habitat below the platforms or on the reef downstream of the platforms are anticipated.

Monitoring Program

Monitoring and NPDES Permit Requirements. The project will require a NPDES permit. This will consist of approvals and ongoing oversight by the US EPA, with a long-term water quality monitoring program under the supervision of the HDOH CWB. This program will be paid for by Hawaii Oceanic Technology adhering to established protocols and standards, and will be designed to detect any impacts on water quality from the operation. Any breach of these conditions could result in loss of the permit, which would cause operations to immediately cease. Hawaii Oceanic Technology management will therefore employ best management practices, ensuring that stocking densities and feeding strategies maintain all water quality parameters within the allowable limits imposed by the permit.

Initial sampling to determine baseline conditions was conducted on September 14, 2007. Additional sampling will begin with a survey in the first year of the lease and then will consist of follow-up surveys, as the operation grows to the stated capacity. These surveys will measure a wide range of water quality parameters, such as salinity, temperature, oxygen saturation (percent O₂), acidity (pH), phosphates (PO₄), silicates (Si(OH)₄), nitrates (NO₂ + NO₃), ammonium (NH₄), total phosphorous (TP), total nitrogen (TN), and water clarity (turbidity). The full extent and frequency of such sampling will be determined during the NPDES permitting process, by HDOH CWB in consultation with US EPA. Hawai'i Oceanic Technology expects that similar standards would govern the NPDES permit and monitoring for the action alternative sites if this project proceeds.

By way of comparison between existing and permitted conditions, the ZOM limitations for turbidity permitted for the CII OOA operation off 'Ewa Beach are a geometric mean of only 0.20 NTU. NELHA water quality values range from 0.10 to 0.14 NTU, while control readings (i.e., natural levels) of the NPDES monitoring program for KBWF are between 0.2 and 0.35 NTU. The HAR listed standard for oceanic waters is 0.03 NTU. Allowable levels under the CII NPDES permit for ammonia nitrogen levels are for a geometric mean of 2.50 µg/L; NELHA values are 1.68 µg/L, and the KBWF monitoring program reports concentrations between 0.5 and 2.0 µg/L. The HAR listed standard for oceanic waters is 1.00 µg/L.

Alternative 2 – Keāhole Point

With respect to water quality, impacts under Alternative 2 are similar to impacts under the Proposed Action. There are no differences between how the operation will be carried out, including size of the lease area, total number of platforms, amount of feed used and fish raised, and the use of deep cold water to power the POP system. In addition, while the sites are approximately 20 miles apart, they are both 3 miles (2.6 nautical miles) from shore and at least 2.3 miles (2 nautical miles) from the nearest reef. Ocean current speeds are similar at

the two sites, creating a similar dilution factor for the waste generated. While Alternative 2 is located above deeper water (5,800 feet [1,768 meters]) than the Proposed Action site (1,320 feet [402 meters]), this additional depth will likely not alter the nature of the dilution, as data from KBWF and CII, as well as the Zone of Mixing modeling results (see table 2.4.2) indicate that the depth at both sites is sufficient to minimize the impact on water quality and benthic habitat in the area. As such, deterioration of water quality down current of the farm will be a less than significant impact and the accumulation of fish feces under platforms or on downstream reefs will have no impact on water quality.

Alternative 3 - No Action

No Impacts

The no action alternative would be to not carry out the proposed action, and would therefore conduct no activities in the water. As such, no impacts to water quality or the benthic habitat would occur.

2.5 BIOLOGICAL RESOURCES

2.5.1 Affected Environment

Introduction/Region of Influence

This section describes biological resources found to occur in the ROI, which is in or adjacent to the Proposed Action ocean lease site, and the Alternative 2 site, both of which are 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 sites are 2.6 nautical miles from shore in 1,320 feet (402 meters) (Proposed Action site) and 5,800 feet (1,768 meters) (Alternative 2 site) 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 ROI 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 and the Alternative 2 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 ROI is not beneficial in analyzing the impacts of the proposed action.

Resource Overview

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.

Terrestrial Biota

The proposed project will not significantly impact any terrestrial biota, including any of the 46 endangered plant species with critical habitat designation on the Island of Hawai'i, or the endangered Hawaiian goose (*Branta sandvicensis*). While seabirds do make their nests on land, they spend the remainder of their lives at sea and are considered marine species. There are

only a few populations of seabirds that breed on the Island of Hawai'i, including the Newell shearwater (*Puffinus auricularis newelli*) in the Puna district (Reynolds and Ritchotte 1999), and the Black Noddy (*Anous minutus*), which nests in the sea cliffs along the Southern coastal strip of Volcanoes National Park (Birding Hawai'i 2004). The proposed OOA site for Alternative 1 (20°05'40.00" N 155°55'40.00" W) and for Alternative 2 (19°43' 39.00" N 156.06' 30.00" W) are infrequently used as a foraging area by seabirds. Observations indicate that most seabird activity in the area is confined to the primary pelagic fishing grounds off West Hawaii, in an area northwest of Keāhole Point, about fifteen miles south of the Proposed Action site, and about five miles north of the Alternative 2 site.

Marine Biota

Due to the depth of the seafloor at both sites, 1,320 feet (402 meters) for the Proposed Action site, and 5,800 feet (1768 meters) for Alternative 2, surveys are extremely expensive, requiring the use of a remote operated submersible-supported research vessel (ROV). To date, eight scientific surveys have been conducted in the deep waters in the area of the Alternative 2 site, and these only dove to a maximum depth of 1,600 feet (488 meters). All of these dives occurred at the Keāhole Point precious coral bed and surrounding area. Information gained from these dives are discussed below in the *Deep Water Corals* section. Based on general knowledge of deep ocean habitat and shallow-water surveys off Kona that assessed the decrease in marine life with increasing depth, the deeper waters of both the Proposed Action site and the Alternative 2 site most likely support a highly limited benthic community and fish faunal assemblage. SCUBA survey dives at several points along the reef face, south of Unualoha Point, have extended down to the juncture with the sand substrate at the bottom of the reef slope, which occurs at a depth of between 120 feet and 155 feet (37 meters and 47 meters). At each site surveyed, the sand substrate extended off towards the west uninterrupted and showed no evidence of benthic macrofauna. The few marine plants or animals found are mostly pelagic, either planktonic algae or free-swimming open-water fishes. These same conditions likely occur at the deeper site for the Proposed Action site and the Alternative 2 site. These species are, by definition, non-residents, and would not be permanently impacted by the proposed activities.

Benthic and Fish Surveys.

No benthic or fish surveys were previously conducted in the Proposed Action site or Alternative 2 site. Fishery data were gathered by interviewing longtime fishermen using the waters around the Proposed Action site, and studying oral histories of longtime fishermen in the waters around the Alternative 2 site. The Proposed Action site, located in waters 220 fathoms deep, 2.6 nautical miles from shore, is not in any area specifically targeted for fisheries, according to interviews conducted in the Cultural Impact Assessment. The proposed site is located about two miles from the area reported by fishers as the trolling lanes for ono and mahimahi that is roughly parallel with the shoreline on the 30 fathom contour line. The proposed site is located about two miles from areas reported by opelu fishermen as the opelu ko`a's along the adjacent shoreline. The proposed site is located in water that is 300 feet deeper and about a mile further offshore from the deepest area fishermen report that is targeted for bottom fish, at about 170 fathoms depth. The proposed site is in waters 400 feet deeper than the area designated by federal management agency

NMFS as a Habitat of Particular Concern for bottom fish, which is all seafloor between 21 fathoms to 153 fathoms. (See the section below on Essential Fish Habitat). At the Alternative #2 site off Keahole Point, fishermen do report trolling on the 1,000 fathom contour line. Alternative #2 site is located in waters 5,800 feet (967 fathoms) deep.

A comprehensive survey of reef fish, coral reef, and associated algae and invertebrates was conducted as part of the West Hawaii Aquarium Project at three nearshore coral reef areas along the Kohala coast in the general area of the Proposed Action site. The Lapakahi site is a protected Marine Life Conservation District. The Kamilo site is an open site used for reef fish collecting, and the Waiakailio Bay site is a Fish Replenishment Area. Data for these three sites is found in the report to the legislature (DLNR-DAR 2004), and is used to measure the effectiveness of the West Hawaii Fishery Management Area (HRS 188F-5). The Coral Reef Assessment and Monitoring Program includes a study site at Kawaihae Harbor. Results from this long term monitoring program at the Kawaihae site indicate that the reef structure habitat is complex, supporting average coral cover, dominated by *Porites* species with low macroalgal coverage. North of the harbor, the basalt pavement is covered by sand and slopes gently. (<http://cramp.wcc.hawaii.edu>)

A comprehensive survey of marine biota was conducted on the reef directly adjacent to the KBWF lease area, including a comprehensive inventory of the benthic biota of the fringing reef crest. A series of four transects of 25 m x 2 m that extended parallel to the reef crest was documented with video footage, which was then digitized for election of random points on the video frames. The survey revealed that the site is characteristic of similar areas along the Kona Coast that have steep drop-offs close to shore, and are subject to heavy wave action during storm surf conditions. There was a high coral cover (50 percent live coral) over a basalt pavement (from the 1801 lava flow). Predominant species included *Porites lobata* (29 percent cover) and *Pocilloporu meandrina* (8 percent).

Fishes were surveyed using visual census techniques over the same transect lines. The fishes showed similarly high levels of abundance and diversity to the corals. Planktivores were numerically dominant (70 percent), as might be expected in an area close to a steep offshore slope. *Cbromis vunderbilti* was by far the most dominant species (66 percent of total abundance). Other damselfish (*Pomacentridae*), surgeon-fish (*Acanthuridae*), and wrasses (*Labridae*) were also present in moderate numbers.

This survey adds further information to the ongoing DLNR monitoring program, providing a detailed baseline of the reef landward of the KBWF site and what the expected conditions are landward of the two project alternative sites.

Sharks. Ten inshore and nine (known) offshore shark species occur in Hawaiian waters. Additional pelagic species may occur in Hawaiian waters, but sightings have been rare or nonexistent and are not included here. None of these species are specifically protected under federal or Hawai'i State law, although the white and whale sharks are protected in many of their primary habitats worldwide and are both listed on Appendix II of the Convention on International Trade in Endangered Species. Of the following list, two species – the tiger shark and great white shark – are considered dangerous to man. The tiger shark is implicated

in nearly all recorded shark attacks in Hawai'i. The Galapagos, oceanic whitetip, and shortfin mako have been implicated in serious and unprovoked, but generally non-fatal attacks, while the grey reef and scalloped hammerhead may attack if provoked (DAR 1993).

Inshore species

Big nosed shark	<i>Carcharbinus altimus</i>
Blacktip shark	<i>Carcharbinus melanopterus</i>
Blacktip reef shark	<i>Carcharbinus melanopterus</i>
Galapagos shark	<i>Carcharbinus galapagensis</i>
Grey reef shark	<i>Carcharbinus amblyrhynchos</i>
Sandbar shark	<i>Carcharbinus plumbeus</i>
Scalloped hammerhead shark	<i>Sphyrna lewini</i>
Smooth hammerhead shark	<i>Sphyrna zygaena</i>
Tiger shark	<i>Galeocerdo cuvier</i>
Whitetip reef shark	<i>Triaenodon obesus</i>

Oceanic species

Blue shark	<i>Prionace glauca</i>
Common thresher shark	<i>Alopias vulpinus</i>
Cookiecutter shark	<i>Isistius brasiliensis</i>
Megamouth shark	<i>Megachasma pelagios</i>
Oceanic whitetip shark	<i>Carcharbinus longimanus</i>
Shortfin mako shark	<i>Isurus oxyrinchus</i>
Silky shark	<i>Carcharbinus falciformis</i>
Whale shark	<i>Rhincodon typus</i>
White shark	<i>Carcharbinus carcharias</i>

Because of the danger that sharks pose to ocean recreation users, concerns have been raised regarding activities that may alter their natural behavior. The State of Hawai'i prohibits the feeding of sharks for the purpose of shark platform tours and a federal regulation to ban this practice has been incorporated into the Magnuson-Stevens Fishery Management and Conservation Act (MSA). Currently, two shark tour operators have platforms in a specific location in the federal waters (i.e., 3 nm from shore) on the North Shore of O'ahu. Prior to the passage of this new federal law (January 2007), the operators fed the sharks, which became habituated to the activity (North Shore Shark Adventures 2006). Interestingly, different species of shark visit the platforms at different times of the day, with sandbar and tiger sharks generally occurring in the early morning, and Galapagos sharks arriving in the late morning to early afternoon. Late afternoon tours generally experienced the fewest numbers of sharks. While public opposition to these tours has been voiced due to concerns

for swimmers and surfers, no studies have been done and no data link this activity to any altered behavior beyond the direct visiting of the platforms.

Looking at the experience of KBWF, public concern over altered shark behavior was also raised for a perceived threat that their aquaculture platforms would create. KBWF countered that if sharks were actually attracted to the platforms; it would pull them further offshore and ostensibly would provide food, which would make them less of a threat to swimmers and surfers (KBWF 2003). In the three years of operation, sharks have been seen regularly by KBWF divers. During a period of high seas in November 2005, divers were unable to tend to the platforms for a few days, and dead fish accumulated at the bottom of the platforms. This likely attracted sharks to the platforms, including one threatening tiger shark. After many failed attempts to lure or scare the shark away, KBWF was required to kill the shark in order to maintain the safety of the divers tending the platforms (KBWF 2006). This incident has led KBWF to work with the DAR and shark experts to develop a mitigation strategy in the event of a recurrence. To minimize potential impacts, the Hawaii Oceanic Technology will implement a shark safety plan as part of this project.

Kona Blue has recorded only rare instances of tiger sharks around its existing farm; probably related to seasonal migrations. For the first eight months of operation, only one fleeting shark sighting occurred: a small tiger shark. There are generally brief influxes of tiger sharks (mano: Galeocerdo cuvier) to the area in the months of September and October of each year. Most of the animals at this time appeared individually, or in pairs, with a range of sizes from 8ft to 15ft in length, and appear to not take up residence on the farm site. This is further confirmed by data from the DAR shark transponder receiver station on the farm site: tiger sharks only very infrequently pass by the site, and rarely do they show any interest in the operation. From July, 2006 to May, 2007, there were a total of eight (8) records of tagged tiger sharks in the Kona Blue farm area. None of these sharks took up residence. One animal passed by the farm site three times in two months, another animal was recorded twice in two months, and three other animals had single records.

Sharks are undergoing worldwide declines for a number of reasons, including the desire for shark as a consumable (either the shark fin market or for shark meat); as a result of bycatch from either recreational fishing (e.g., hunting) or other fishing (e.g., trawler nets, on longline hooks, or gill nets that are set for tuna or swordfish): from pollution; or from commercial uses of shark skin, cartilage, etc. There are no enforceable international regulations reducing ongoing overharvesting. In some parts of the world, certain shark species are currently considered functionally extinct because they are ecologically no longer able to play a role in the marine ecosystem (McCosker 2007). Sharks of the eastern Pacific are among the most threatened regionally (McCosker 2007).

Deep Water Coral. A complete census of all of the known deep-water precious coral beds was conducted in 2000 and 2001. This included submersible-supported surveys of the Keāhole Point bed and surrounding area located at 19° 46' N, 156° 06' W. This bed is more than 20 miles from the Proposed Action site and approximately 5 miles from the Alternative 2 site. In 2000, researchers surveyed 16,000 square kilometers of seafloor off Keāhole Point at a depth of 1,181 to 1,591 feet (360 to 485 meters). In 2001, the team returned to the same

area and surveyed 24,500 square kilometers of seafloor in 1,246 to 1,483 feet (380 to 452 meters) of water (Grigg 2002). Two species of deep-water coral, *Corallium regale* and *Gerardia* sp. (red and gold coral, respectively), were found in a patchy distribution at a depth of 1,247 to 1,476 feet (380 to 450 meters). The precious coral bed off Keāhole Point has been estimated at 0.96 square kilometer. The roughly equivalent numbers of young and old gold coral colonies found at Keāhole Point suggest healthy recruitment to the population. Based on radiocarbon dating (Roark et al. 2006), a typical one-inch-diameter *Gerardia* is approximately 800 years old. Gold coral samples collected from the Keāhole Point bed ranged in age from 450 to 2,742 years. While the dives focused on surveying the known precious coral beds in the area and were of limited duration (8 hours each), no benthic macrofauna was observed below these depths and only a few bottomfish were seen during the dives. Two sets of two additional dives each were conducted at the Keāhole Point bed in October 2004, and focused on paleoclimatology and macroinvertebrate-associated species (HURL, pers. comm.). As with the 2000-2001 dives, deep sea corals occurred in sparse numbers and were confined to a specific depth. “At depths below about 1200 m (3,937 ft), the bottom consisted mainly of sandy silty carbonate muds and silty carbonate muds with occasional basaltic boulders.” Benthic organisms were first seen shallower than 800 m with increased abundance at depths of 400 m (HURL, dive logs PV-592 through PV-595).

Dolphins. Of the nonendangered cetaceans two species, the bottlenose dolphin (*Tursiops truncatus*) and spinner dolphin (*Stenella longirostris*), are known year-round residents of the Hawaiian Islands. Bottlenose dolphins are widely distributed throughout the world in tropical and warm temperate waters. They are not considered threatened or endangered under the ESA or depleted under the MMPA. Due to their isolation and the lack of sightings between the Hawaiian and eastern tropical Pacific populations, the Hawaiian bottlenose dolphins are considered a separate stock. This species is primarily coastal, occurring from Hawai‘i to Kure Atoll. There are an estimated 743 bottlenose dolphins within 28.7 miles (25 nautical miles) of the main Hawaiian Islands. As waters beyond 28.7 miles (25 nautical miles) of the coast or the waters of the Northwestern Hawaiian Islands (NWHI) were not surveyed, this number is considered an underestimate of the population size (NOAA Fisheries 2006a). There have been three documented strandings in the Hawaiian Islands, with the most recent in 1998 due to an entanglement in a mooring line off the coast of Maui.

Spinner dolphins are widely distributed throughout the world in tropical and warm temperate waters. They are not considered threatened or endangered under the ESA or depleted under the MMPA. The Hawaiian spinners belong to a stock that is separate from those involved in the tuna purse seine fishery of the eastern tropical Pacific. This stock is common and abundant throughout the Hawaiian archipelago. The best available estimate of abundance for the Hawaiian stock of the spinner dolphin is 2,805 individuals (CV = 0.66) (Carretta et al. 2005).

Spinner dolphins occur in both oceanic and coastal environments. Most sightings of this species have been associated with inshore waters, islands, or banks (Perrin and Gilpatrick 1994). While sightings in offshore waters are infrequent, some groups of spinner dolphins have been seen in the channels between islands and in other offshore waters around the main Hawaiian Islands (Mobley et al. 2000). Spinner dolphins are expected to occur in

shallow-water (164 feet [50 meters] or less) resting areas throughout the middle of the day, moving into deep waters offshore during the night to feed. Surveys were conducted in six areas, four inshore and two offshore. There is one inshore study area extending to 100 fathoms that is located near the Proposed Action site from Malae Point south to Puako. Another inshore study area covers the area by Keahole Point out to 100 fathoms. One offshore study area includes the area of the Alternative 2 site off Keahole Point (Ostman-Lind et al. 2004).

The closest known resting area to the Proposed Action site is considered a “secondary” resting site at Honokoa Bay, located about five miles southeast of the Proposed Action site. Ostman-Lind states that, “it is notable that no critical resting area is known for the Kohala coast, from Puako north” (Ostman-Lind 2004).

The closest known primary resting areas to the Alternative 2 site is located at Makako Bay, where dolphins were reported to rest in an area within 75 m from shore during the 2004 study, and between 200-300 m offshore in earlier studies (Ostman-Lind 2004). North of Keāhole Point, schools usually gather on the shallow shelf off Mahai‘ula in mid-morning, presumably after feeding on the grounds. The school then moves along the reef edge, parallel to the shore and south into Makako Bay. Around 11 AM, they usually arrive in the shallow (less than 82 feet [25 meters]) sandy area in the most protected part of the bay, where they may spend the next two to three hours resting. The movement out of the bay, after the rest period, usually follows a “zig-zag pattern” (Norris et al. 1994) of back and forward movements as the school moves along the coast, perhaps for several kilometers, before moving out to deeper water.

The pattern of movement into the rest areas is also highly variable. Norris and Dohl (1980) found the “movement toward the coast may be a general one and not necessarily pointed to a precise rest cove,” with a number of different schools entering Kealakekua Bay at different times and from different directions. This led the researchers to conclude that “the bays and coves used for rest periods may not necessarily be the direct target of daily inshore movement,” and that the location of the rest area is selected on an opportunistic basis. There would appear, therefore, to be no obligation on the part of the dolphins to use a particular rest area, or to adhere to a particular group. Both the bottlenose dolphins and the spinner dolphins are year-round residents in the waters off the island of Hawai‘i.

In addition to spinner and bottlenose dolphins, the Pacific waters and coastlines of the Hawaiian Islands provide habitat for a variety of other marine wildlife. Twenty-two marine mammal species, including six endangered whales and the endangered Hawaiian monk seal (*Monachus schauinslandi*), inhabit these waters (NOAA Fisheries 2006c). Numbers and types of animals are not consistent, as the distribution and abundance of both marine mammals and sea turtles in Hawaiian waters vary seasonally, from nearshore to offshore, and spatially (i.e., from island to island and between different sides of the islands) (Calambokidis et al. 1998; Mobley et al. 2001), but overall these waters provide high quality habitat for numerous marine mammal species, particularly larger odontocetes (toothed whales). Several non ESA-listed but MMPA-listed marine mammals known as odontocetes are found in Hawaiian waters and may occur in the project waters. These include pygmy (*Kogia breviceps*) and dwarf

sperm whales, killer whales (*Orcinus orca*), false killer whales (*Pseudorca crassidens*), pygmy killer whales (*Feresa attenuate*), pilot whales, (*Globicephala macrorhynchus*), melon-headed whales (*Peponocephala electra*), rough-toothed dolphins (*Steno bredanensis*), and several species of spotted dolphins, the most common of which is *Stenella attenuate*. Dolphin species that are most likely to be found in and around the project area include bottlenose dolphins, spotted dolphins, rough-toothed dolphins, and false killer whales, though other species could easily occur. The bottlenose, spotted, and rough-toothed dolphins and false killer whales have all been observed in the project area or in other offshore waters of the Kona Coast.

Rare, Threatened, or Endangered Species

Humpback Whales (Megaptera novaeangliae). The Proposed Action site and the Alternative 2 site are both located outside of the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS). The Proposed Action site is at approximately the 220 fathom (1,320 feet) contour line. The Alternative 2 site is at approximately the 916 fathom (5,496 feet) contour line. The sanctuary boundary extends west from Keāhole Point, along the 100 fathom line to Upolu Point, the northern most point of the Big Island in North Kohala. An estimated 2,000 to 5,000 humpback whales (*Megaptera novaeangliae*) come to Hawai'i each year between November and May, a significant portion of the total North Pacific population of 6,000 to 10,000 whales (HIHWNMS 2003). More recently, data for humpback whale populations taken from the 2008 SPLASH Report done in conjunction with the Hawaiian Islands Humpback Whale National Marine Sanctuary (Calambokidis, et al., 2008, SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific, p. 2). This report concluded that, “After reconciling all within and cross-regional matches from both the primary match and rechecks, a total of 7,971 unique individuals were cataloged in SPLASH.” (Calambokidis, et al., 2008, p. 2).

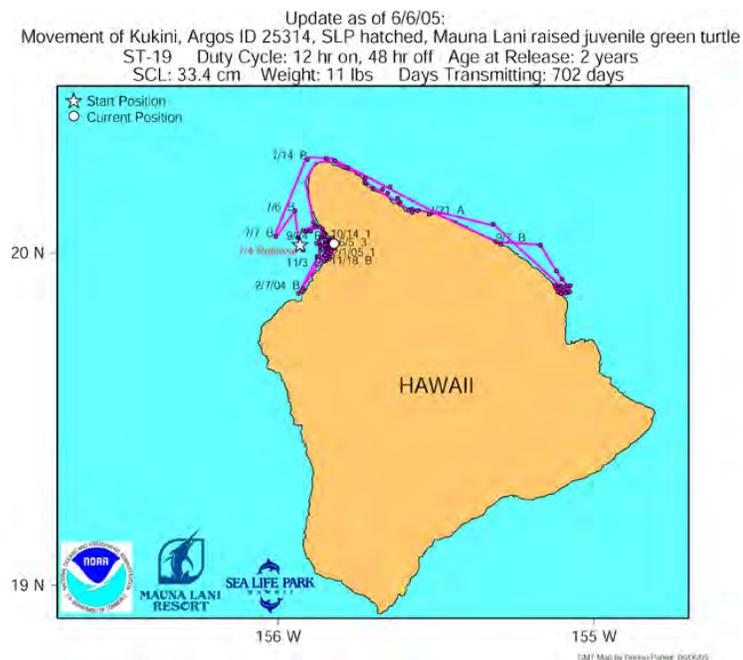
Adult humpbacks are approximately 45 feet long and weigh 40 to 45 tons. Calves, all of which are born in Hawaiian waters, can be 14 feet long and two tons at birth. Humpbacks have very long pectoral fins, equal to approximately one-third of their body length. Humpback whales occur frequently over the winter months. Aerial surveys indicate that the whales mainly inhabit leeward coasts, in waters shallower than 100 fathoms. Ponds containing a calf seemed to be closer to shore. Highest densities of whale population was identified to be near Keahole Point, and north of Kawaihae Harbor. Kawaihae Bay is considered to represent important humpback whale habitat. Considering how wide ranging humpback whales can be, it is possible that they traverse the Proposed Action site or the Alternative 2 site.

Hawaiian Monk Seals (Monachus schauinslandi). An estimated 1,252 Hawaiian monk seals (*Monachus schauinslandi*) occur throughout the archipelago, with approximately 90 percent living in the NWHI. The best estimate of the population in the MHI is 52 individuals, based on aerial surveys in 2001 (Baker and Johanos 2003). The chapter on “Hawaiian Monk Seal” in “U.S. Pacific Marine Mammal Stock Assessments: 2008” was prepared by Carretta, et al. (NOAA-TM-NMFS-SWFSC-434, US Department of Commerce, NOAA, NMFS, SWFC). This study concludes that:

“The NMFS collects information on seal sightings reported by a variety of sources. Recently, the number of such reports has increased and related database improvement efforts have been underway. The total number of individually identifiable seals documented in this way in 2006 was 83, the current best minimum abundance estimate” (Carretta, et al 2008: p. 42). Most of these seals were observed on Ni‘ihau and Kaua‘i, although rare sightings have occurred in the waters off the Kona Coast. During two four-day periods in 2000 and 2001, NMFS conducted aerial and ground surveys. In this, the most complete stock assessment of monk seals in the MHI, only one monk seal was observed in the waters off the Island of Hawai‘i. In addition, one monk seal was born on Hawai‘i in each of these years. Monk seals are curious animals and often inspect untended nets and marine debris, which has led to the deaths of numerous seals over the years (Nitta and Henderson 1993).

Green Sea Turtles (*Chelonia mydas*). Green sea turtles are abundant in the waters off the Kona Coast. While total population estimates are very difficult to determine, it appears from the steady increase in nesting females at the primary rookery at French Frigate Shoals in the NWHI that this species is reaching carrying capacity (Balazs and Chaloupka 2004). In addition to the natural population at the Kona Coast, since 1990 the Mauna Lani Resort and NOAA have released over one hundred juvenile turtles that were raised for two to three years at Sea Life Park on O‘ahu. Many of these turtles have been released carrying a satellite transmitter that has provided a greater understanding of their movements (Figure 2.5-1). While some travel great distances around the islands and across deep water, they all spend most of their time in shallow foraging grounds (Balazs 1994).

Figure 2.5-1. Movement of a Satellite-Tagged Green Turtle.



Hawksbill Turtle (Eretmochelys imbricata). Of all of the sea turtles worldwide, the endangered Hawksbill turtle is considered the most reef-associated and is truly a coastal species. While much less common in Hawaiian waters than the green turtle, resident hawksbills nest in the MHI. At most, 30 females nest in any given year at 10 beach sites found exclusively on the islands of Hawai'i, Maui, Moloka'i, and O'ahu (Balazs et al. 1998). A major portion of the nesting occurs on Kamehame Beach on the southeastern coast of the Island of Hawai'i. The only available satellite tracking is of two females in 1995. The data showed that both turtles traveled along the coast 180 miles to feeding grounds on the Hāmākua coast, where they remained until they returned to Kamehame Beach to nest again. There is no significant evidence that this species, once hatchlings are settled to the reef, ever returns to the open sea (Kinan 2007). Other species of sea turtle, including the leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*), are rare visitors to the islands, with one and three sightings, respectively, ever in the MHI (NOAA Fisheries and USFWS 1998).

Essential Fish Habitat

Essential fish habitat (EFH) is designated for all species that are managed by federal fishery management plans. EFH for precious corals includes all known beds. Off the Kona Coast there are two beds, the Keāhole Point red and gold coral conditional bed and the Miloli'i-South point black coral bed. Essential fish habitat for shallow-water and deep-water bottomfish species includes the seafloor in waters between 0 and 131 feet (0 to 40 meters) depth. Due to the broad definition of EFH, NMFS created the designation "Habitat Area of Particular Concern (HAPC)" in order to provide a better understanding of key habitats within the required definition. HAPC for bottomfish is all seafloor between 131 and 918.64 feet (40 and 280 meters).

Critical habitat, areas of land that are considered necessary for an endangered (or threatened) species to recover, is defined for all species protected under the ESA. Of the above-mentioned species, none have critical habitat designated in the main Hawaiian Islands. Humpback whales have no critical habitat designation, and critical habitat for monk seals and green sea turtles occurs only in the NWHI.

The Proposed Action site occurs in 1,320 feet (402 meters) of water, 3 miles (2.6 nautical miles) from land and the Alternative 2 site is in 5,800 feet (1,768 meters) of water, also 3 miles (2.6 nautical miles) from land. The primary operating site at either location will be approximately 220 acres of open ocean water.

The focus of the Hawaii Open-ocean Aquaculture Research Program (HOARP) (Ostrowski and Helsley 2003) was to establish which, if any, of the above concerns are real in open circulation tropical conditions. Routine observations of water quality, health of the ecosystem outside the cages, interactions with protected species, and changes in the benthic assemblage were made to assess these potential impacts of open ocean aquaculture in tropical oceanic settings.

Observations over the past 6 years demonstrated that there was no measurable change to the water quality at the site. Observations of chlorophyll-a and turbidity suggest there was no

important change in phytoplankton abundance near the cages, or that the change was so small that it could not be distinguished from the natural background variability.

The only change in the benthos was an increase in the abundance *Capetella capitata* and *Neanthes arenaceodentata*, known indicator species of organic enrichment. The increase in abundance of these two species, rarely observed in the oligotrophic sediments of the offshore, suppresses the abundance of the more common organisms that characterize the normal assemblage. This change in abundance provides evidence for a local species diversity change under the farm operational site. This change, however, was shown to be entirely reversible in time periods of less than a year of production, and thus it should not be considered to be a long-term detrimental impact.

Observations of environmental variables were made around a research site at the Cates International, Inc. offshore fish farm, about 3.22 km (2 miles) south of Ewa Beach, Oahu for the past 6 years. Initially, these were simply water quality measurements and assessment of changes in the micro-benthos beneath the cages and at control stations some 400 m up and down stream that were made as part of a set of proof-of-feasibility experiments. The research at the experimental site was transferred to the farm site in 2001 when the farm commenced operation.

Based on knowledge of currents on site (see appendix Current Study Report) and in the general area, and an analysis of the environmental monitoring of the KBWF operation (KBWF 2006) and HOARP, the deep depth and huge quantities of water that will move through the sites will dilute all generated nutrients and particulate matter to natural levels by the edge of the zone of mixing, which is ocean lease site to a depth of 150m.

While Humpback whales and green sea turtles will likely transit through the area, the distance from shore and depth of the sites is well beyond the ocean area within 100 fathoms depth where a majority of humpback whales are found. This also removes the potential of the platforms causing a bottleneck in migration patterns.

The platforms will most likely act as Fish Aggregation Devices (FADs), primarily attracting baitfish and predatory pelagic species. The sites are not known to be an important foraging area for seabirds.

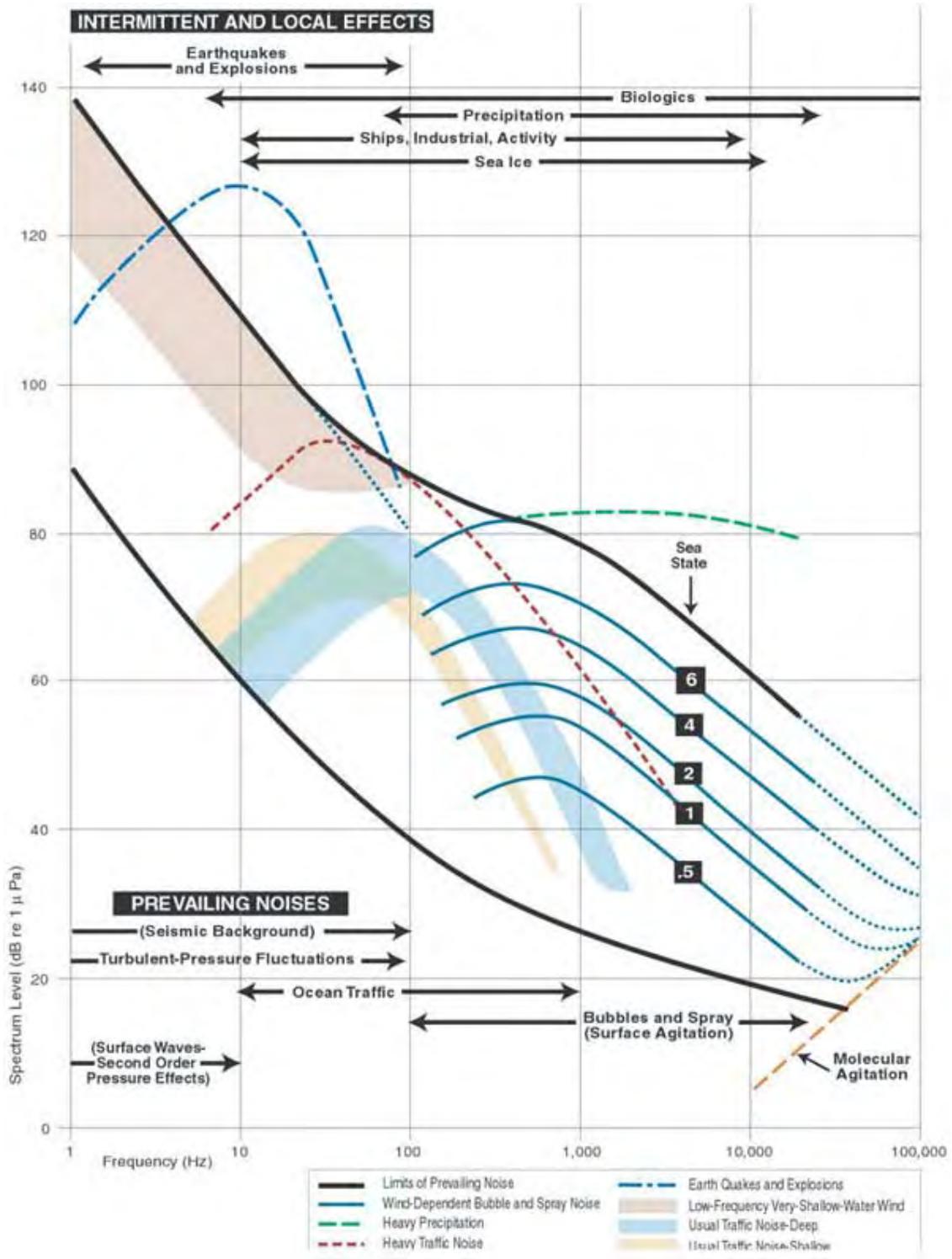
Marine animals use sound to obtain detailed information about their surroundings. They rely on sound to communicate, navigate, and feed. Marine mammals, such as dolphins, use sound to locate and identify objects such as food, obstacles, and other marine mammals such as whales. By emitting clicks, or short pulses of sound, and listening to the echo, dolphins can detect individual prey and navigate around objects underwater. All sound values are water-standard values unless otherwise specified. All references are broadband-level values given in dBs, standardized at 1 microPascal at 1 m (dB re 1 microPa at 1 m) for source levels (SL) and dB re 1 microPa rms (root mean squared) for received levels (RL).

The sounds produced by marine life are many and varied. Marine mammals, such as humpback whales and bottlenose dolphins, produce sounds over a wide frequency range, from less than 10 Hz to greater than 200,000 Hz, depending on the species of marine mammal. Marine mammal calls can actually increase ambient noise levels by 20-25 underwater dB in some locations at certain times of year. Blue and fin whales produce low-frequency moans at frequencies of 10-25 Hz with estimated source levels of up to 190 underwater dB at 1 m. The ambient noise levels at frequencies of 17-20 Hz increase off coastal California during the fall and winter months due to blue and fin whale calls.

The ocean is filled with sound. Underwater sound is generated by a variety of natural sources, such as breaking waves, rain, and marine life. It is also generated by a variety of man-made sources, such as ships and military sonar. Some sounds are present more or less everywhere in the ocean all of the time. The background sound in the ocean is called ambient noise. The primary sources of ambient noise can be categorized by the frequency of the sound. Below is the sound spectra of typical sound sources found in the world oceans (Wenz, 62) and source levels.

In the frequency range of 20-500 Hz, ambient noise is primarily due to noise generated by distant shipping. Even after removing any noise generated by ships close to the receiver, distant ships can be detected. The amount of noise is greater in regions with heavy shipping traffic. There tend to be fewer ships in the southern hemisphere, and low-frequency ambient noise levels are substantially lower as a result. Noise generated by shipping has increased as the number of ships on the high seas has increased (Andrew, et al., 2002).

Figure 2.5-2 From Wenz, 1962, Wenz curves for sound sources in the world ocean, SL are in units of dB re: $\mu\text{Pa}^2/\text{Hz}$.



Sounds generated by human activities are an important part of the total ocean acoustic background. Undersea sound is used for many valuable purposes, including communication, navigation, defense, research and exploration, and fishing. However, some sounds are just a by-product of another activity, such as the noise generated by ships and by offshore industrial activities, including oil drilling and production. Sounds generated by human activities cover a wide range of frequencies, from a few Hz up to several hundred kHz, and a wide range of source levels.

A significant noise impact would be one that would:

I. Result in underwater or in-air noise levels that are equal to or exceed NOAA Fisheries guidelines for Level A or B harassment of marine mammals (i.e. peak in-water levels generally at or above 160 dB re: 1 μ Pa rms, or in-air levels generally at or above 90 dBA) and/or in-water noise levels that exceed 190 dB re 1 μ Pa rms for sea turtles; or

II. Result in noise levels that would exceed an hourly average (L_{eq}) of 50 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.) at residential property lines, or result in maximum instantaneous noise levels that exceed 70 dBA during the daytime and 65 dBA at night.

The source levels for some sounds generated by human and natural activities similar to the Oceansphere operations and estimates of the noise level created during Oceansphere operations itself are given in the following table. The Oceansphere will employ low rpm high torque thrusters which will produce low frequency noise at less than 100 dB at 1 m. This will drop off to The Maintenance and Installation operations of the Oceanspheres will use standard work boats with sound output levels of below 110 dB at 1 m in the frequency range of 20-500 Hz. The surface buoy and power generators will not generate noise levels over 50 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.) at residential property lines or outside of the Ocean Lease Site, or result in maximum instantaneous noise levels that exceed 70 dBA during the daytime and 65 dBA at night.

Anthropogenic and Oceansphere Operations Sound Sources

<u>Sound Source</u>	<u>Broadband Source Level</u> (dB re 1 microPa at 1 m)
<u>Tug and Barge</u> (18 km/hour)	<u>171</u>
<u>Supply Ship</u> (<i>Kigoriak</i>)	<u>181</u>
<u>Large Tanker</u>	<u>186</u>
<u>Icebreaking</u>	<u>193</u>
<u>Medium Sized Ship</u>	<u>130 - 160</u>
<u>Blue Whale</u>	<u>190</u>
<u>Estimated Oceansphere (OS)</u>	<u>100</u>
<u>Estimated Work boat during OS Installation</u>	<u>110</u>
<u>Estimated Workboat during OS Maintenance/ Harvest</u>	<u>110</u>

Oceansphere operations will never exceed 160 dB re 1 mPa at 1 m. The work boats are in the small to medium class range and will not be operated at full speed during installation operations. This is also true of maintenance and harvesting operations. The Oceanspheres are not high speed vehicles and as a result will employ low rpm high torque thrusters which will not produce excessive noise levels.

2.5.2 Environmental Consequence***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 EFH. 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 impacted during the course of the project implementation and operation. Direct negative impacts result when biological resources or critical habitats are altered, destroyed, or removed during the course of project implementation.

Indirect negative impacts to biological resources may occur when project-related 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 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).

Summary of Impacts

Table 2.5-1 summarizes impacts on biological resources.

**Table 2.5-1
Summary of Potential Biological Resource Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Flora	○	○	○	○
Terrestrial fauna	○	○	○	○
Marine benthic organisms	○	○	○	○
Fishes (excluding sharks)	⊙	⊙	⊙	○
Rare, endangered, or threatened species	⊙	⊙	⊙	○
Humpback whales	⊙	⊙	⊙	○
Sharks	⊙	⊙	⊙	○
Spinner and bottlenose dolphins and large odontocetes	⊙	⊙	⊙	○

In cases when there would be beneficial and adverse impacts, both are shown on this table.

LEGEND:

- | | |
|---|-----------------------|
| ⊗ = Significant impact | + = Beneficial impact |
| ⊙ = Significant but mitigable to less than significant impact | N/A = Not applicable |
| ⊙ = Less than significant impact | |
| ○ = No impact | |

Proposed Action – Malae Point

No Impact

Flora. There is no terrestrial flora or marine macroflora in the proposed lease areas. As the seafloor is at 1,320 feet (402 meters) at the proposed site, and is 5,800 feet (1,768 meters) at the alternative site, the only algae would be the fouling on the platforms and associated apparatus, whose growth would be assisted by the increased organic loading within the platforms. This fouling growth is scheduled to be regularly cleaned as part of biweekly

platform maintenance. This growth will not create a significant impact as long as weather conditions and other factors allowed the daily cleaning to take place. As is normal practice in the open ocean aquaculture industry, the growth will be air dried above the water for four hours in sunlight, and allowed to fall into the water, where it will be eaten by fish in the area, or decompose as it falls through the water column.

Terrestrial fauna. The proposed action would not impact terrestrial fauna. This area is not considered important for birdlife, and the subsurface placement of the platforms would eliminate any potential impacts.

Marine Benthic Organisms. The primary benthic organisms of concern in Hawai'i are the entire coral reef ecosystem. The coral reef is sensitive to changes in water quality, especially from the increase in nutrients and particulate matter. Nutrients can cause algal blooms that cover corals and other benthic organisms. Extremely high levels of particulate matter can settle on the coral. Both have the effect of reducing the amount of sunlight that reaches the coral, which can ultimately kill the coral. While these are important concerns, any impact from these platforms on the reef is very unlikely. Water quality testing of the two existing operations, CII and KBWF, indicate only slightly increased levels on nutrients and particulate matter directly down current of the platforms (see Section 2.4, Water Quality), reaching background levels within 99 feet (30 meters) of the platforms. In addition, surveys conducted by the State Division of Aquatic Resources biologists on the pristine reef directly inshore from the KBWF site (0.5 mile [0.8 kilometer] offshore) showed no significant change in either coral or reef fish abundance (<http://www.kona-kampachi.com>). Given that these platforms will be 3 miles (2.6 nautical miles) from the seaward edge of the nearest reef, no impact on the reef community is expected.

As with marine algae, there will likely be a fouling growth of marine benthic fauna on the platforms and associated apparatus. This 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 plankton. No measurable impacts are expected on adjacent communities. The presence of these organisms would primarily be a function of the presence of the artificial substrates, rather than any other perturbation to the environment. Grazing and browsing fishes may remove much of this fouling, but occasionally divers would need to scrape occluding fouling from these surfaces. Some of this fouling would fall to the bottom, and become part of the general benthic processes of detritivores and decomposers in the soft substrate of the deep sea. The amount that would reach the barren seafloor would spread across a wide area and would be inconsequential to this habitat. Evidence from the two existing aquaculture sites, which occur in less than 200 feet (61 meters) of water, suggests no major change in the diversity of benthic organisms. The OOA operation off 'Ewa Beach, O'ahu experienced periodic increases in abundance of polychaete worms (*dorvilleids*, of the genus *Ophryotrocha*, and capitellids) underneath the platform but also showed occasional periodic increases in abundance of benthic detrital feeders at the control sites, well removed from the platform area (Ostrowski et al. 2001). If these sites, occurring in 200 feet (61 meters) of water, show minimal impact on the benthic habitat, it is surmised that the

potential impact on the seafloor at the proposed site (1,320 feet [402 meters]) depth or more so at the alternative site (5,800 feet [1,768 meters]) is so slight as to be not quantifiable.

Less Than Significant Impacts

Fishes. Fish may be attracted to the sites for a number of reasons: the fouling on the platform, the occasional release of small quantities of uneaten food from the platform, the scent of dead fish from inside the platform before they are removed, the visibility of fish inside the platform, and the aggregative nature of fish in open water, as known and documented with FADs. While observations from the 'Ewa Beach platform experiment indicate that the variety of reef fishes around the platform changes over time, it is highly doubtful that more than the occasional reef fish will ever be observed at these platforms. The distance from the proposed site to the nearest reef (approximately 3 miles, 2.6 nautical miles), the depth of the water (1,320 feet [402 meters]), and the length of time they would have to be in open water avoiding predators to make it to these platforms makes their presence very unlikely. This is also likely for the alternative site, which is also approximately 3 miles (2.6 nautical miles) from the nearest reef, and in 5,800 feet (1,768 meters) of water. Similarly, while coastal pelagic species (e.g., 'ōpelu, *Decapterus macarellus*) have congregated around KBWF platforms, to the extent that fishermen are able to target them in the area (N. Sims, pers. comm.), these species would be too far from their natural environment at this location and would likely not remain near the platforms for any duration.

These platforms are expected to 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. This is evidenced in part by the fact that the State of Hawai'i has installed 57 offshore FADs around the main Hawaiian Islands, with nine between Kawaihae to the north and Kauna Point to the south off the west coast of the Island of Hawai'i. According to KBWF documents, fishing activity has increased in the “formerly barren stretch of water, with ono and 'ōpelu fishermen, in particular, profiting from the FAD effects of our facility” (KBWF 2006). Given that the platforms of this project will be placed 3 miles (2.6 nautical miles) from shore and 180 feet (55 meters) below the surface, it is possible that the species and overall number of fish attracted to the platforms will be quite different than that experienced by KBWF but are nevertheless expected to result in an increase in aggregating fish. Hawaii Oceanic Technology intends to provide local fishermen similar access to the area as that provided by KBWF. Impacts to 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.

While the proposed site is about a mile away and in waters 300 feet deeper than the deepest waters targeted by bottom fish fishermen (Fukuyama 2008), and in waters about 400 feet deeper than the bottom fish designated habitat area of particular concern, fishers interviewed expressed concern about the potential impact of the Oceansphere platforms on the distribution of bottom fish (Fukuyama 2008, Cambra 2008). They felt it would have an adverse impact on the bottom fish fishery.

To address this concern, analysis was done of the evidence of impacts on the benthic environment at the two existing aquaculture sites, which occur in less than 200 feet (61 meters) of water, which suggests no major change in the diversity of benthic organisms. If these sites, occurring in 200 feet (61 meters) of water, show minimal impact on the benthic habitat, it is surmised that the potential impact on the seafloor at the proposed site (1,320 feet [402 meters]) depth is so slight as to be not quantifiable. In addition, a water quality model was used to determine at what point ambient levels will be reached for water quality parameters. The zone of mixing model shows that by 150 meters below the surface where the Oceansphere is located, water parameters are at ambient levels. See the section above on water quality for more information. Based on these analyses, the impact of the Proposed Action on bottomfish is anticipated to be less than significant.

There is also recognition by these bottom fish fishers that they were not sure if there would be an effect or not, and if the effect would be beneficial or not, until a platform was deployed and they could see any changes happening to their fishery. The fishers also noted that the bottom fish fishery has been in serious decline for years with longer periods of closure every year (Fukuyama 2008, Cambra 2008). Maintaining ongoing dialog with the fishers would be a useful way to address this potential issue.

Rare, Endangered, or Threatened Species. There are a few conceivable ways for open ocean fish farming to negatively impact rare, threatened, endangered, or protected species: the project may present a significant obstruction to animal movements, the animals may become entangled in the platforms or moorings, or the animal's natural behavior 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.

The relatively small size and specific attributes of the taut mesh platform design proposed for this project suggest that the risk of negative impacts from obstruction to animal movements or from entanglements is negligible. There are no data available to support any conclusions on either short-term or long-term behavioral impacts to larger marine wildlife species.

Monk seals have been observed in the waters off the Kona Coast, though infrequently, with at most one seal being observed in any of the surveys (Baker and Johanos 2004). Monk seals are curious animals and often inspect untended nets and marine debris, which has led to the deaths of numerous seals over the years. The platforms proposed for this project are constructed with no loose netting or lines and a very small mesh size (0.25 inch across), effectively eliminating this risk.

While still classified as threatened under the ESA, the green sea turtle (*Chelonia mydas*) is relatively abundant in the waters off Kona. The coral reef habitat is the primary foraging grounds for both adult and juvenile green turtles, and they generally remain in the shallow coastal waters, both for shelter and refuge from their primary predator, the shark. Adults will swim across the open ocean 1,000 miles to French Frigate Shoals in the Northwest Hawaiian Islands to breed. It is during this migration that they are most likely to visit the proposed or alternative sites. It is highly doubtful that a turtle would linger in such a vulnerable habitat.

Nevertheless, as with the monk seal, the taut and small mesh of the platforms will prevent the possibility of entanglement for any migrating turtle. In addition to the green turtle, the rare hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), and loggerhead (*Caretta caretta*) sea turtles may also encounter the platforms in the open sea, but the possibility of entanglement would be even less for these species, given the similar risk and rarity of occurrence in Hawaiian waters.

Humpback whales.

While both the proposed and alternative site lie outside the boundaries of the HIIHWNMS, whales transit the area during the winter. Concerns were raised during the development stage of this project regarding the whales' movement throughout the general area of the project operations; usually following a longshore track (N-S) (Sarver and Sims 2003). As there are no mooring lines attaching these platforms to the seafloor, and given that the first proposed site is in 1,320 feet (402 meters) of water and 3 miles (2.6 nautical miles) from land, while the alternative is in 5,800 feet (1,768 meters), and 3 miles (2.6 nautical miles) from land, whales will easily be able to move around the platforms.

The only real loss of habitat for the whales is the waters within the submerged platform from which they are excluded. The percentage of habitat loss from the entire sanctuary is difficult to determine, as the total available habitat in the sanctuary cannot be readily calculated. However, the percentage of habitat lost from one kilometer of sanctuary waters, for example, can be estimated. Twelve submersible platforms will each occupy a volume of 3,600 cubic meters for a total of 43,200 cubic meters. One kilometer (0.6 mile) of sanctuary waters (measured along the coastline) with an average depth of 50 fathoms (around 100 meters) and a width (from coastline to the proposed and alternative sites) of around 5 kilometers equates to a total volume of 500 million cubic meters. The loss of habitat from the presence of the platforms is therefore 0.0086 percent of the available habitat in this one kilometer of sanctuary coastline. The loss of habitat is equivalent in volume to the loss of habitat from the displacement of a three 15,000 metric ton vessels.

Gabriele, et al 2003 note that "Although Kawaihae is the commercial port for West Hawaii, it has relatively low levels of vessel traffic, slowly increasing in primarily tourism and recreation sectors. New proposed commercial uses of nearshore waters, including a proposed aquaculture facility, would contribute an unprecedented steady stream of traffic, as well increasing the risk of entanglement and marine pollution"

The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the nearshore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small-mesh platforms, there is no risk of entanglement by whales in the platforms. Data from NMFS marine mammal stock assessments and strandings confirm that entanglement problems for whales are due to slack-line fishing gear or extensive loose-mesh fishing nets.

As with spinner dolphins (discussed below), the major entanglement concerns for humpbacks and other whales are from floating gill nets, drift nets, long-lines, and slack lines, such as crab pot float lines. A comprehensive review of the potential for entanglements by humpbacks or other whales conducted by USACE for the University of New Hampshire Open Ocean Aquaculture Demonstration project (Celikkol 1999) indicated that almost all entanglements were due to fishing gear, such as cod traps, gill nets, weirs, and seines. Amongst all these observations, there is no record from any US aquaculture operation of entanglement of humpback whales, or other marine mammals, in the taut moorings or net panels of fish platforms. The risks of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of open ocean in which the whales can maneuver around the platforms, the spherical shape of the platforms, and the depth at which the platforms are stationed.

By contrast, submersible platforms are designed to keep fish enclosed within the platform. There are no flat walls, funnels, or bottlenecks in the platform designs. The platform surface is primarily taut mesh, more akin to a vessel hull than to a transparent, yielding gill-net. The platforms are streamlined to reduce drag through the water, and they are strutted to maintain very high tension on the net material. The platforms present a hard rounded surface to an approaching animal, which would naturally tend to deflect the animal in one direction or the other, rather than halt their progress, as might a flat wall or funnel net. To visually orienting marine mammals such as humpbacks, this mesh would probably appear to present almost a solid surface. The more appropriate comparison would therefore be the interaction between anchored ships and humpback whales, rather than fishing gear and whales.

Celikkol (1999) analyzed the entanglement risk of various components of Sea Stations OOA platforms (including the mooring array, which is not relevant for the proposed action) and concludes: “The platforms (themselves) do not impose any known whale entanglement risk.”

For humpback whales, it would still be important to perform any in-water large maintenance or construction activities outside of any seasonal windows.

Spinner and bottlenose dolphins and other large odontocetes.

According to the KBWF Final Supplemental EA (p. 34), the bottlenose dolphins present at their net pens are probably attracted to the farm site by a combination of three factors: (1) the presence of midwater structures acting as FADs, (ii) the occasional provisioning from “leakage” escapes when the net pens are opened for divers to enter or exit the net pen, and (iii) interactions with divers outside the net pen. While the Oceansphere will likely act as a midwater FAD, the design of the Oceansphere addresses the two other factors that attract dolphins. The Oceansphere avoids escapes by bringing the Oceansphere to the surface for harvest and maintenance operations which will avoid subsurface escape passages, and allow divers to enter or exit directly into the Oceansphere, thereby reducing any time spent by divers outside the Oceansphere. Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh. This will deny to dolphins a food source and they will lose interest.

The Proposed Action site does not appear to be near any significant resting site or foraging site for the spinner dolphin (*Stenella longirostris*). As discussed above in the description of the biological resources, during the day, the spinner dolphins rest in areas less than 50m deep. At night, they feed in waters up to 200 meters. Both the Proposed Action site and the Alternative 2 site are much deeper than the waters where the spinner dolphins have been observed.

In addition to spinner dolphins, the surveys from 1989 – 1992, and the surveys conducted in 2003 (see Ostman-Lind 2004), observed other delphinid species including Spotted dolphins (*Stenella attenuate*), short-finned pilot whales (*Globicephala Macrorhynchus*), pygmy killer whales (*Feresa attenuate*) and bottlenose dolphins (*Tursiops truncaatus*). Spotted dolphins were observed feeding several kilometers offshore in waters over one km deep. Short-finned pilot whales and pygmy killer whales were observed to be present only sporadically, and further offshore. Bottlenose dolphins were observed in small schools in waters less than 50m deep, and are known to be very opportunistic in their feeding behavior (Ostman-Lind 2004). These toothed whale species, which forage on smaller fish for prey, such as those that would be contained in the proposed project platforms, are known from and documented to occur in project area waters (NOAA Hawaii Humpback Yearly Whale Watch).

The foraging movement patterns of spinner dolphins demonstrate that they could venture from their near shore resting waters to the proposed or alternative sites, particularly if either site becomes a FAD, which is likely, for prey species. Other dolphin species would most likely be drawn as well, as the platforms would be a novel object and are likely to be an attractant to some degree. If sharks are drawn to the platforms, and dolphin species are also attracted to the platforms, and both scenarios are likely, then the likelihood of these different species being located in the same area at the same time would increase as a result of the platforms. This in turn could lead to increased predation on dolphins or other marine mammals in the area. There is a degree of uncertainty with regards to the severity (intensity and frequency) of this collocation of predator (shark)/prey (marine mammal) species. A pod of healthy adult dolphins visiting the sites can likely defend themselves from any sharks in the area given that the terrain is open sea. However, single or juvenile animals may be at risk.

Spinner dolphins have been occasionally anecdotally observed traveling through the existing KBWF site, apparently neither avoiding nor being attracted to the platforms (KBWF 2006). However, no systematic surveys have been done to document the presence or absence of dolphins and other toothed whale species, or potential increases in dolphin numbers or residency around the KBWF platforms. While concerns were previously raised by the public over the proximity of the KBWF site to the spinner dolphin migratory route, as well as their resting area in Makako Bay, in the nearly three years of operation, there appears to be no adverse impact from the current farm.

To further mitigate the potential for entanglement, the Proposed Action includes an advanced platform design which does not have mooring lines; therefore the proposed operations do not pose any risk to these animals from entanglement.

Resting spinner dolphin schools usually remain in sheltered waters between 80 and 160 feet (25 and 50 meters) deep, more than 2 miles (3.2 kilometers) from the proposed project sites. Given the proposed open ocean location for the alternative site, and the mostly pelagic location of the proposed site, it is anticipated that effects from the project may be less than significant. In order to verify that these conclusions are accurate over time, and that no significant adverse impacts to MMPA-protected marine species will occur, the project proponent will include certain monitoring practices, as delineated below. It is not known if foraging behavior will be impacted in the short or long term. It is also not known what the long-term impact will be on marine mammal species from shark presence that is considered likely to increase. There is a potential for beneficial impacts to occur if fish prey aggregate under the platforms and thus foraging becomes more efficient for spinner dolphins and other marine mammals. This increase could offset any predation on dolphins or other species by sharks that would be attracted for the same reasons.

There is a negligible risk of entanglement by spinner dolphins or other marine mammals in the stretched mesh of the platforms. A comprehensive search of available records (NMFS Stock Assessments) and a review of interactions between marine mammals and Hawai'i's fisheries (Nitta and Henderson 1993) all confirm that the major entanglement problems for small marine mammals are from slack-line fishing gear or extensive, loose, large-mesh nets. Floating gill nets, drift nets, long-lines, and slack lines, such as crab pot float lines, represent the major entanglement concerns for marine mammals. Other dolphin species are also occasionally injured or hooked while taking bait or fish off fishing lines. Spinner dolphins are known to have become entangled in nets or net fragments, but the animals are only vulnerable when there is no tension on the mesh. There are recent records of both bottlenose dolphins and common dolphins becoming entangled in the predator nets around tuna platforms in South Australia (an average of three entanglements per year: Kemper and Gibbs 2001; Wursig and Gailey 2002). However, these entanglements were exclusively in the large-mesh predator nets (mostly greater than 15 centimeters, or 6-inch mesh) that were set in shallow water, so that the nets hung loosely at low tide. However, there is no record from any US aquaculture operation of entanglement of dolphins or other marine mammals in the taut-net panels of fish platforms.

The South Australia dolphins discussed above were apparently attracted to the platforms by the whole pilchards that were fed to the tuna. The fish feed pellets planned in this proposed action would not have the same attraction to dolphins.

Currently there is no way to determine the effects on dolphins or other free-ranging marine mammals (or on large pelagic fish) of the visible presence of contained farmed large fish in the open sea, combined with the scent that will emanate from the platforms, particularly from dead fish (which has been shown in other OOA projects to attract sharks on the occasion when weather prevents daily cleanings). The Alternative 2 site, being further away from Kawaihae Commercial Harbor than the Proposed Action site, may undergo longer periods between cleanings during periods of inclement weather.

Under the MMPA, harassment is defined as “any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild”

(Level A Harassment) or “has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering” (Level B Harassment). Dolphins or other marine mammal wildlife, of which there are numerous species that would transit project area waters year round, could potentially be disturbed by either direct impacts (increased shark presence, increased noise related to project actions and daily boat operations, or other human related disturbances) or indirect impacts (water quality changes, ecosystem changes).

Human-related disturbance, such as noise from project vessel operation, or incidental ship collisions, could affect marine mammal behavior. There may also be a cumulative impact on marine wildlife from the platforms over time. The effect of disturbance, noise, and other manmade sounds on marine mammals can potentially have a harmful effect on marine organisms in a variety of ways. As with humans, an introduction of noise can cause stress, which can increase the risk of mortality in marine organisms. Exact reactions to noise depend on a variety of factors, including time of year, behavioral or reproductive state of an individual species, ambient noise levels, etc. The daily magnitude and intensity of noise would be expected to change from normal conditions under the proposed action. However, the level of the proposed activity is not expected to have a significant impact on marine mammals.

Water Quality modeling discussed above indicates that ambient levels of water quality will be achieved by the edge of the zone of mixing, which is the ocean lease site to a depth of 150m. Consequently, there should be no negative impacts to marine mammals or other biological resources from water quality.

Potential indirect impacts may occur to dolphins or other marine mammals as a result of the platform acting as a FAD, from increased human activity within or directly adjacent to sensitive habitat areas, from accidental releases of fuel, oil or lubricants used in vessels, or on the platforms. Standard operating procedures, which include oil spill prevention and response training and equipment, as well as reporting requirements, will be used by the Company’s aquaculture personnel to mitigate the risk of these accidental releases and the potential negative environmental impact it could cause. In addition, because of the open ocean location of the project, level of use, and distance from shore, both the risk of these incidents and the impacts sustained if they occur are minimized.

Since all outcomes on dolphins and other marine mammals are unknown at this point, as no project of this scope has ever occurred in project waters or similar waters in the open ocean, and as no quantified data exist to support either argument, impacts are cautiously considered less than significant. A monitoring program will be established as part of this project to watch for any adverse affects that may occur. If any adverse affects are identified project operations will be modified to minimize those effects. Consultation with appropriate federal agency officials will guide the protocol for managing and monitoring any interactions between employees and marine mammals. Impacts are expected to be less than significant with this monitoring program in place.

Monitoring Program

- Monitoring by qualified observers, preferably by third-party qualified biological resource personnel, of spinner dolphin and other marine mammal species (and sea turtles) in the area of the platforms would be required to ensure no deleterious effects of any kind result from interactions (particularly unforeseen) with the platforms.
- Reports of all monitoring will be distributed to agency personnel and research groups.
- Surveying should be done daily by cleaning and maintenance personnel of Hawaii Oceanic Technology, however, surveying also should be done at least once a week initially, with surveys decreasing in frequency once quantified data show less than significant effects are occurring.
- All on-site project personnel will be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal and state laws.
- Local marine wildlife experts and agency personnel will be contacted and informed of the impending work that exceeds daily and routine maintenance; in addition, wildlife experts and agency personnel must be immediately contacted in the event of any marine wildlife concerns, including collisions, strikes, or entanglements that may occur during the project.
- Preparation and presentation of a Marine Mammal Monitoring Plan will be incorporated into the project design.

Sharks. In meetings with the public, special interest groups, and various other forums, there has often been concern expressed about the potential for the platforms of the proposed operation to act as FADs and thus, via increasing fish species in a localized area, increasing the likelihood of sharks in the area. Although increasing fish species offers great potential benefits to fishermen, as discussed above, it is also recognized that the FAD action of an OOA operation may attract sharks to the area. In addition, sharks may be drawn to the platforms because of a greater availability of food (either from the excess fish food, from the visibility of the fish inside the platforms, from the scent of dead fish in the platforms, or because of the greater biomass of other fish outside the platform). The impact on biological resources or on humans from increased shark presence in the location of the proposed project would have to be studied and potentially mitigated.

While it is possible that if sharks are drawn to the platforms, it could lead to increased predation on dolphins or other marine mammals in the area, there are no recorded instances. The likelihood of different species being located in the same area at the same time would increase as a result of the presence of the platforms and all observations will be recorded per the monitoring program.

An increase in resident sandbar sharks (*Carcharhinus plumbeus*) did occur in the second stage of the 'Ewa Beach platform trials, though not in the initial series of experimental platforms. Randy Cates (owner and operator of the moi farm offshore of 'Ewa Beach) suggested that

based on his observations; there will be no aggregating effects of the platform on sharks (pers. comm.). There is no quantifiable evidence showing an effect or no effect. Therefore, it is not known if sharks may be aggregated to the platforms, and if so, if this would mean an actual increase in the number of sharks in the overall area, or just a shift in distribution of the same numbers that already occur. If sharks are drawn to the platform, they will presumably be drawn away from other adjacent areas, thereby reducing the apparent density of sharks (which might result in a decreased risk to the public from sharks). However, no conclusions can be drawn at this time as there are only anecdotal data.

As this project proposes a substantial increase in total production and number of platforms, more divers will be required to complete regular maintenance. Both the proposed and alternative sites are 3 miles (2.6 nautical miles) from land and potentially less protected from storms and dangerous sea conditions. These factors could increase the number of mortalities within the platforms as well as increase the length of time mortalities remain in the platforms, causing an increase in attraction by sharks and other predators to the platforms. While this argument remains speculative and will require further study to determine the actual impact, the proposed project would create the opportunity for continual interactions between humans (divers) and sharks. The need to remove sharks is not incidental and in fact may be a necessary part of the success of the operation. To minimize potential impacts the following shark safety plan will be put in place as part of this project.

Shark Safety Plan (Modeled after DAR).

Divers should always be aware that sharks could appear. If a shark is sighted, the list below are procedures to be followed:

- Divers are to notify each other by hand sign (hand held fin-like on top of head) and divers are to aggregate together and face the shark.
- Divers should try to keep their backs to the platform, buoy, boat or other obstacle.
- Divers are not to make any sudden movements, swim away hurriedly, splash, take photographs or flash lights at the shark.
- Divers should surface to discuss if the dive should continue as soon as it is safe to do so.
- No dive is to continue if any diver feels uncomfortable or would prefer to abort.
- No employee is ever expected to enter the water when sharks are around the platforms; any dive undertaken when sharks have been sighted must be at the diver's sole and absolute discretion.

- All sharks sighted are to be noted in the dive log. Record number of sharks, identifying features (species, length, distinguishing marks), behavior towards divers, and period of residence around the platforms.
- Management must be notified of these encounters.

There may be occasions when the offshore crew may have to use extra precautions with sharks. These occasions include, but are not limited to; 1) Shark at site is aggressive towards divers and other objects, 2) Shark has taken up residence or has become territorial at the site. At this point, this is defined by viewing the same shark at the site for 2 or more days in succession. All procedures mentioned above still apply. In addition, extra precautions are listed below:

- Divers/Snorkelers must add an additional diver to the team size (i.e. 3 divers instead of the normal 2).
- Divers/Snorkelers must remain within view on surface or underwater.
- One of the dive team must carry a shark “poker” (large stick) if the divers remain in close proximity (<20 ft).
- If divers are not in close proximity, every diver should have a “poker.”

The diver supervisor on site is responsible for all dive operations so he/she can suspend any dive operations if they believe it is necessary. If any one shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP, Operations and/or the President. Prior to any further action, management will consult with the local office of Division of Aquatic Resources to determine the next course of action (i.e. baiting, hooking and/or tagging) to discourage the shark from visiting the site.

Additional Conservation Measures

Monitoring and Reporting. Hawaii Oceanic Technology will undertake, at its own cost, to develop a Monitoring Plan (MP) for documenting all interactions between the project and marine mammals, sea turtles, and sharks. This will be prepared in consultation with NOAA Fisheries. The assistance of marine mammal scientists, HIIWNMS staff, and/or NOAA Fisheries experts will be obtained to design a program that ensures the maximum practical amount of usable information is collected and incorporated into an MP. This would be similar, though less broad in scope, to the current MP undertaken and currently in process by the US Navy, NAVFAC Pacific, for Hawaiian waters, based on recommendations by local marine mammal mitigation experts (Smultea et al. 2007). Mattila and Walters (pers. comm.) also indicated that “detailed measures of abundance or spatial distribution were not needed, but that basic records of interactions would suffice.” That is, the MP will include a record of any interactions between marine wildlife and the project structures (platforms), such as any close approach of a whale, such as within 30 meters (100 feet) (as regulated by the MMPA).

All Hawaii Oceanic Technology staff shall also adhere to federal recommendations or instructions in the unlikely event of any collisions, or ship strikes. The initial response will be

to immediately call the NOAA Fisheries Marine Mammal Stranding Hotline (1-888-256-9840). Hawaii Oceanic Technology could work with HHHWNMS officials to train staff in appropriate first-response measures, although liability concerns need to be addressed prior to undertaking this mitigation measure. Hawaii Oceanic Technology recognizes the complexity of these issues, with sanctuary protocols and ESA considerations, but still affirms their willingness to assist sanctuary or NOAA Fisheries in any such manner that is deemed appropriate.

Alternative 2 – Keāhole Point

With respect to biological resources, impacts under Alternative 2 are similar to impacts under the Proposed Action. There are no differences between how the operation will be carried out, including size of the lease area, total number of platforms, amount of feed used and fish raised, and the use of deep cold water to power the POP system. In addition, while the sites are approximately 20 miles apart, they are both 3 miles (2.6 nautical miles) from shore and from the nearest reef.

Like the Proposed Action site, there is no impact on terrestrial flora or marine macroflora in the lease area, nor to terrestrial fauna. While the density of marine benthic organisms would most likely be lower beneath the Alternative 2 site, and the impact of falling detritus (i.e., uneaten food, fouling growth and fish feces) would be much less, the depth at the Alternative 2 site is sufficient to elicit a no impact determination.

Like the Proposed Action, there would be less than significant impacts to fishes, even though the platforms may act as a FAD and attract pelagic species. It may provide additional fishing opportunities for fishermen in the area, which is a potentially beneficial impact. Alternative 2 would also have less than significant impacts on rare, endangered or threatened species, such as dolphins, whales, seals and turtles. There are more resting areas and a higher number of spinner dolphins observed in the nearshore waters adjacent to the Alternative 2 site. However, because the Alternative 2 site is located above deeper water (5,800 feet [1,768 meters]) than the Proposed Action site (1,320 feet [402 meters]), there is a greater buffer between the site and preferred habitat of spinner dolphins, humpback whales, sea turtles and all reef-associated species. Nevertheless, while the risk is small at both the Proposed Action site and the Alternative 2 site, it does exist and is not entirely removed at these sites. Mitigation measures described above for the Proposed Action site would apply to the Alternative 2 site as well.

Like the Proposed Action, impacts on sharks will also be less than significant at the Alternative 2 site, and minimized though the mitigation measures of monitoring and managing interactions with sharks.

Alternative 3: No Action

No Impacts

The no action alternative would be to not carry out the Proposed Action, and would therefore conduct no activities in the water. As such, no impacts to biological resources would occur.

2.6 HAZARDOUS MATERIALS AND WASTES

2.6.1 Affected Environment

Introduction/Region of Influence

The following section addresses hazardous materials and conditions, such as the use and storage of hazardous materials and wastes within the ROI. The ROI for this resource includes all harbor structures and facilities used by the OOA operation and the proposed leased ocean areas for the OOA operations and offshore ocean platform site.

Resource Overview

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.

Specific Hazardous Materials and Conditions

The following sections address specific hazardous materials and conditions of concern related to materials and wastes that may be used, stored, or transported within the ROI. 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.

Existing Conditions of Personnel. A majority of the personnel who will be employed as part of the proposed project are already working in the fishing industry and are likely already involved in boat maintenance activities. These individuals are likely adept at managing exposure to the range of hazardous materials that are commonplace with boat maintenance activities.

Existing Conditions of Project Setting. Located at Kawaihae Harbor, the project storage site does not contain any known hazardous materials, wastes, or any other threats to human health and 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 use levels. Any hazardous materials and or hazardous wastes generated from the project would be handled by the marine maintenance facility conducting boat conservation and repair activities upkeep. The underwater proposed locations of the aquaculture apparatus does not currently contain any known hazardous materials or wastes.

Hazardous Materials Disposal within ROI. No hazardous waste will be produced by Alternative 1 or Alternative 2.

2.6.2 Impact Analysis

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.

Summary of Impacts

Table 2.6-1 summarizes impacts regarding hazardous materials and conditions.

Table 2.6-1
Summary of Potential Impacts from Hazardous Materials and Waste Management

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Waste Management	⊙	⊙	⊙	○
Hazardous Materials Management	○	○	○	○
Hazardous Waste Management	○	○	○	○
Petroleum, Oils, and Lubricants	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

- | | |
|---|-----------------------|
| ⊗ = Significant impact | + = Beneficial impact |
| ⊙ = Significant but mitigable to less than significant impact | N/A = Not applicable |
| ⊕ = Less than significant impact | |
| ○ = No impact | |

Proposed Action – Malae Point

Less Than Significant Impacts

Hazardous materials and waste management. Hazardous materials identified that may potentially be introduced to the ROI as a result of the Proposed Action are paints, solvents, hydraulic fluids, and other substances related to boat maintenance activities, which would occur off-site at a designated marine maintenance facility. The commercial repair facility is tasked with properly labeling, handling, storing, and disposing of hazardous materials and wastes used or generated in accordance with local and state hazardous materials and waste regulations by the maintenance facility. No identifiable hazardous materials will be stored or handled at the project's work site location at the Kawaihae Commercial Harbor.

No Impacts

Waste management. There will be no impacts to waste management under the Proposed Action. The fish will be handled by an established fish processing company located in Kona who will be contracted to prepare the ahi for shipment. The Company will work with the fish processing company to encourage beneficial uses of the processing wastes for use as cattle feed and biodiesel, or as a source for extracts for nutraceuticals.

Alternative 2 – Keāhole Point

Less Than Significant Impacts

Impacts under Alternative 2 are similar to impacts under the Proposed Action. No identifiable hazardous materials will be stored or handled at the project's work site location at the Kawaihae Commercial Harbor.

No Impacts

There will be no impacts to waste management under Alternative 2.

Alternative 3 - No Action

No Impacts

Under the no action alternative, the current level of activities would not change and the overall effect would be no impact. Any increase in waste produced would not be due to this project.

2.7 TRAFFIC AND TRANSPORTATION

2.7.1 Affected Environment

Introduction/Region of Influence

The Hawaii Oceanic Technology Ahi Aquaculture Project proposes two alternatives operating from a land-based location at Kawaihae Commercial Harbor (Figure 1-2). Under the Proposed Action, the OOA operations and ocean platform site will be off the North Kohala coast approximately 3 miles (2.6 nautical miles) due south west of Malae Point. Under Alternative 2 the OOA operations and ocean platform site would be off the North Kona Coast approximately 3 miles (2.6 nautical miles) due west of Keāhole Point (Figure 1-5). Kawaihae Commercial Harbor will be the base for land and water operation activities. Containers of feed would be delivered by barge to the OOA site and stored on site. When fully operational the company will require 1,000 tons (900 metric tonnes) of feed stock per month arriving in 40 containers. This supply will be received at Kawaihae Harbor. The food would be delivered by boat to the open ocean operation area twice per month. The ROI for the entire operation includes both Kawaihae Harbor and the leased ocean area.

Resource Overview

Land Traffic and Transportation

Existing Traffic Volumes and Conditions and Transportation Facilities

Direct access to Kawaihae Commercial Harbor is from a harbor road, shown below, just north of its junction with Akoni Pule Highway. Two miles to the south, Akoni Pule Highway intersects with two of the island's major highways, Queen Kaahumanu Highway and Kawaihae Road.



The harbor road, north of Akoni Pule Highway, is a two-lane asphalt roadway providing access to Pier 1, the Department of Land and Natural Resources (DLNR) Small Boat Harbor and several businesses including a gas station, mini mall and real estate office. The roadway ends in a turn-around at the DLNR Harbor. Five to eight feet of paved shoulders are on both sides of the roadway. The shoulders are utilized for overflow parking for the businesses. An approximately 9 foot wide gravel or landscaped strip is situated between the west shoulder and the harbors perimeter fence.

Akoni Pule Highway, shown below, consists of two 12-foot wide travel lanes with 6 to 12 foot wide paved shoulders. The roadway is posted at 45 mph, with a reduced speed of 35 mph north of the main harbor entrance gate. The southern terminus of the highway occurs at an unsignalized intersection with Kawaihae Road which is a major regional connector providing access towards Hilo through the town of Waimea, and with Queen Kaahumanu Highway which services the western Hawaii coastline. The Queen Kaahumanu leg of the intersection is stop controlled.



Akoni Pule Highway north of the intersection with the harbor road traverses the north-west Big Island coast to the town of Hawi. In the vicinity of the project site, Akoni Pule Highway is a two lane asphalt roadway with 4 to 12 foot shoulders on both sides of the roadway. The roadway is sloped in the uphill direction as it moves away from the harbor. Access to businesses occurs on both sides of the roadway. A limited number of parallel parking stalls are striped along the west shoulder of the roadway fronting the service station.

Historical twenty-four hour traffic counts were examined to understand the daily traffic patterns within the study area. Two Hawaii Department of Transportation (HDOT) traffic count stations are located within the study area, Kawaihae Road at Queen Kaahumanu Highway (Station 11-E) and Akoni Pule Highway 100 Yards North of Kawaihae Road (Station C-12-F).

HDOT conducted traffic counts on Akoni Pule Highway at milepost 1.71, between the Mini Mart and Kaewe Place at the guardrail, on May 23, 2006. The peak morning traffic heading towards Pololu Lookout recorded 40 vehicles between 6:30 AM and 6:45 AM. The peak afternoon and evening traffic heading towards Pololu Lookout recorded 92 vehicles between 3:45 PM and 4:00 PM. The peak morning traffic heading towards Queen Ka'ahumanu Highway recorded 101 vehicles between 6:45 AM and 7:00 AM. The peak afternoon and evening traffic heading towards Queen Ka'ahumanu Highway recorded 69 vehicles between 1:45 PM and 2:00 PM, with the same volume for the 15-minute count between 3:15 PM and 3:30 PM.

The Traffic Analysis Report for the Hawaii Commercial Harbors 2020 Master Plan (Ng 2001) noted that total daily traffic count in 2000 was 5,244 at Akoni Pule Highway north of Kawaihae Wharf; 6,725 at Kawaihae Road between Kawaihae Wharf and Queen Kaahumanu Highway; 7,650 at Kawaihae Road between Queen Kaahumanu Highway and Akulani Street; and 10,365 at Queen Kaahumanu Highway between Kawaihae Road and Waikoloa Road (Ng 2001:4). The report concludes that, "...in Kawaihae, acceptable (LOS C or better) conditions were found for roadway segments and at intersections" (Ng 2001: 5)

Ocean Traffic and Transportation

A survey of recreational activity in the general area north of Malae Point was conducted from August 2007 to October 2008 by HOT. The survey was conducted on seven summer days with low ocean swells and light trade winds. The timing of the survey was selected to ensure that it represented a period of heavy use on a weekend.

Observers were situated on Malae Point at 200 feet elevation and used a horizon measurement chart to estimate distance from shore. During the 46 hours of observation at the Proposed Action site data points were gathered and recorded. During the entire 46 hours of observation at Malae Point only two vessels entered the ocean lease site and were in the area for less than a half hour period (Figure 2.7-1). During the observation period a maximum of 12 vessels were traveling near the site within three miles but not inside the site (Figure 2.7-2).

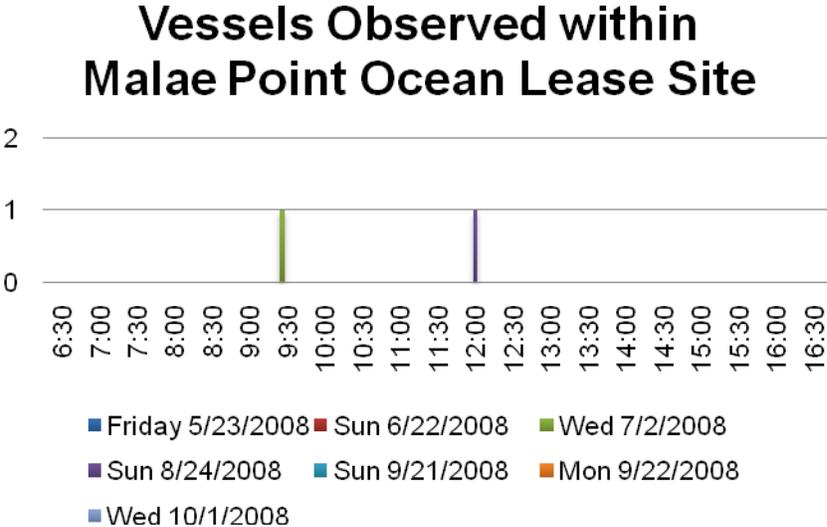


Figure 2.7-1 Number of observed vessels in the Ocean Lease Site and the time and date.

Vessels Observed Outside the OLS and within Three Miles

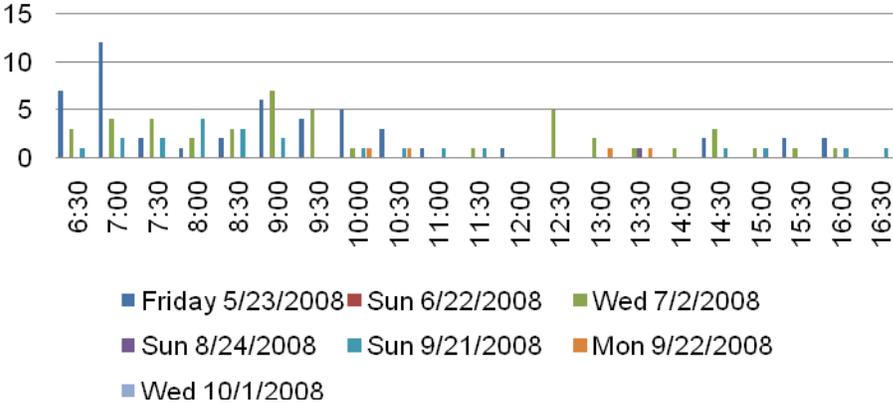


Figure 2.7-2 Number of observed vessels outside the Ocean Lease Site but within three miles and the time and date.

Most activity in the general Malae Point area consisted of trolling fishing vessels with some recreational dive boats. Most of the dive recreational activities are in shallower water (less than 100 feet) and most of the trolling is performed within one mile off shore. Few boats are expected to venture out into the Hawai'i Oceanic Technology operations area, which would be located 3 miles (2.6 nautical miles) out to sea. Barge traffic utilizes a route that places the barges further west of the Proposed Action site.

Young Brothers, Ltd. and the Hawaii Superferry were informed about our location, and they found no navigational problems associated with the Ocean Lease Site Malae Point location. The harbor master (Ian Birnie, retired) and harbor manager at Kawaihae Harbor were consulted also and they found no conflict of harbor operations with the Ahi Project operations.

Vessel activity in the area around the Alternative 2 site is more widely distributed than the Proposed Action site, with vessels utilizing the waters both east and west of the Alternative 2 site. Trollers also utilize the 1000 fathom contour, which is located somewhat west of the Alternative 2 site.

2.7.2 Environmental Consequences

Impact Assessment Methodology

The traffic impact analysis completed to support the Hawai'i Oceanic Technology Ahi Aquaculture Project describes land- and ocean-based traffic within the ROI.

Factors Considered for Impacts Analysis

The criteria for assessing effects on traffic conditions in the ROI included 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 include volume, LOS¹ (level of service), and volume to capacity ratio (V/C)². 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 ROI, then that would be deemed a significant impact on traffic conditions.

Summary of Impacts

Table 2.7-1 summarizes traffic and transportation impacts.

**Table 2.7-1
Summary of Potential Traffic and Transportation Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Land	⊙	⊙	⊙	○
Ocean	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

¹LOS (level of service) 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 (FHWA, no date).

²V/C (volume capacity ratio) 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 V/C ratio of 1 means the roadway is functioning at capacity and congested conditions are expected (APA 2002).

Proposed Action – Malae Point

Less Than Significant Impacts

Land. Hawai'i Oceanic Technology would provide at least 22 full-time equivalent jobs, 10 of which would be for the offshore fish platform operations. Employees would be traveling to the harbor and land-based operation centers from surrounding areas. Anticipated hours of operation would be Monday through Friday during the daytime (e.g., 6:00 AM to 3:00 PM). An estimated 22 employees would be traveling to the harbor and ten would go on to work at the offshore fish platform site on a semi-regular basis for feeding, maintenance, and periodic fingerling stocking and fish harvesting. Employee parking at the harbor would be located at the Hawai'i Oceanic Technology boat and equipment storage facilities. In addition, there will be one truck every two weeks taking ahi to Kona for processing.

If the estimated 22 Hawai'i Oceanic Technology employees were driving separate vehicles and traveling to or from the harbor, approximately 11 of the employees would be driving before the morning peak traffic period, and 11 would be driving after the morning traffic period. The geographic distribution of where the employees would be coming from can assume that 1/3 of the employees would come from Kohala, 1/3 from Waimea and 1/3 from North Kona. Therefore, there would be approximately 3 or 4 more vehicles added to the roads from each major direction before the morning peak hour and after the morning peak hour. The same would be assumed for the afternoon, when 3 or 4 more vehicles would be added to the roads going in each major direction before and after the peak afternoon traffic time.

The additional traffic generated by Hawaii Oceanic Technology can be assumed to be included in the future traffic projections included in the Traffic Analysis Report for Kawaihae Harbor for the Hawaii Commercial Harbors 2020 Master Plan, which states, "...future traffic volumes in and out of Kawaihae Harbor were estimated to increase 200% over existing volumes. Other non-harbor traffic volumes were increased...by 110% near Kawaihae Harbor" (Ng 2001:6).

The future traffic projection in the 2020 Master Plan offers an analysis of what could be considered as the potential cumulative and secondary impact of this Proposed Action along with all the other development planned for the Kawaihae Harbor area.

The Traffic Analysis Report assumes that certain road improvements are made to accommodate the future traffic in the area. These future improvements include the construction of a new two-lane road from Queen Kaahumanu Highway to Akoni Pule Highway that will bypass the harbor area (listed as Tier 1 project), and a new road between Waimea and Kawaihae (proposed as a Tier 2 project (2006-2010). The report concludes that, "with these improvements in place, there would be adequate access to the harbors" (Ng 2001: 8).

Ng (2001) continues:

The proposed bypass road will reduce traffic volumes in the immediate vicinity of Kawaihae Harbor. Assess would be provided by the existing road, which would be connected at an improved junction with the future Queen Kaahumanu Highway to Akoni Pule Highway corridor (Ng 2001: 9).

The report concludes that "...a decrease in through traffic near the harbor and the addition of a second access road from Kawaihae Road would provide acceptable peak hour conditions along the roadway and at the critical intersections" (Ng 2001: 10).

Based on this analysis, it is concluded that the additional traffic generated by the Hawaii Oceanic Technology at Kawaihae Harbor would not cause a significant impact on traffic in the area, and is included in the future traffic projections in the 2020 Master Plan traffic analysis that concludes the roadways would be operating at acceptable peak hour conditions.

Since Hawai'i Ocean Technology activities would provide the marine community with contracts for salvage, transportation, platform maintenance, and boat leasing, this economic activity could increase both land-based and ocean-based traffic.

Fingerlings would be purchased from the PACRC in Hilo and transported to Hilo Harbor. Upon arrival, they would be placed in the holding tank of a ship and transported from Hilo to the OOA site, where they would be pumped through a hose into the submerged platforms. This would happen infrequently and the additional traffic in and out of Hilo Harbor would be negligible.

No Impacts

Ocean. Periodically, feed in canisters that fit into the step of the OOA platform would be transported to the OOA site via boat. A crane would remove the empty feed canister and replace it with the full canister. Operations would be performed within the ocean lease area, and the boat would approach the site from outside of the Humpback Whale Marine Sanctuary.

SCUBA divers would be deployed almost daily to inspect the health of the tuna, observe feed of tuna, and remove mortalities. Workers would visit the site every workday to maintain platforms and to supervise feeding of the fish. Two boats would be used to travel to the platforms daily, five days per week (Monday through Friday), resulting in an estimated twenty roundtrip boat trips per week.

Periodically, platforms would be raised to the surface, disassembled at the OOA site and placed on work boats for transport to the maintenance site at Kawaihae Commercial Harbor for refitting.

Tuna would be harvested at sea. The fish would be transported to Kawaihae Harbor and trans-shipped to refrigerated truck and transported to an existing fish processing operation in Kona.

Some portion of the harvest would be iced and prepared for delivery to wholesalers and distributors on the Islands of Hawai'i, O'ahu, Mau'i and Kaua'i. Where possible, product would be put on a refrigerated delivery truck and sent to neighboring islands via container ships or the Superferry. The remaining portion of the harvest would be frozen and shipped via air freight to wholesalers and distributors on the US mainland and Japan.

The marine traffic associated with the proposed project would not interfere with the lanes of traffic for the Kawaihae Harbor. Kawaihae Harbor currently operates below capacity and the additional marine traffic introduced through the proposed action will have no impacts.

Alternative 2 – Keāhole Point

Less Than Significant Impacts

Land. Impacts under Alternative 2 are similar to impacts under the Proposed Action. Land based operations are identical, located at Kawaihae Commercial Harbor. The further distance from Kawaihae Harbor to the Alternative 2 site will increase use of fuel, which is an operational consideration. The increase of vehicles for project operations and the road traffic caused by the additional vehicles would occur over a period of five years. As discussed for the Proposed Action, roadway expansion projects are currently underway that would increase the roadway's LOS rating and would be able to accommodate additional traffic. Impacts would be less than significant.

No Impacts

Ocean. Under Alternative 2, impacts to marine traffic would be similar to impacts under the Proposed Action. Marine traffic would increase within Kawaihae Commercial Harbor, however, the harbor is currently operating at levels below capacity and will be able to accommodate the increase in traffic. The increase in vessel traffic that may result at the Alternative 2 site is not considered to be significant because the ocean lease site is a very small part of the expansive ocean area off the Kona coast that is calm, safe for boating, and good fishing.

Alternative 3 - No Action

No Impacts

Under the no action alternative, there would be no impacts as no aquaculture project would be undertaken and existing traffic and transportation conditions would not change.

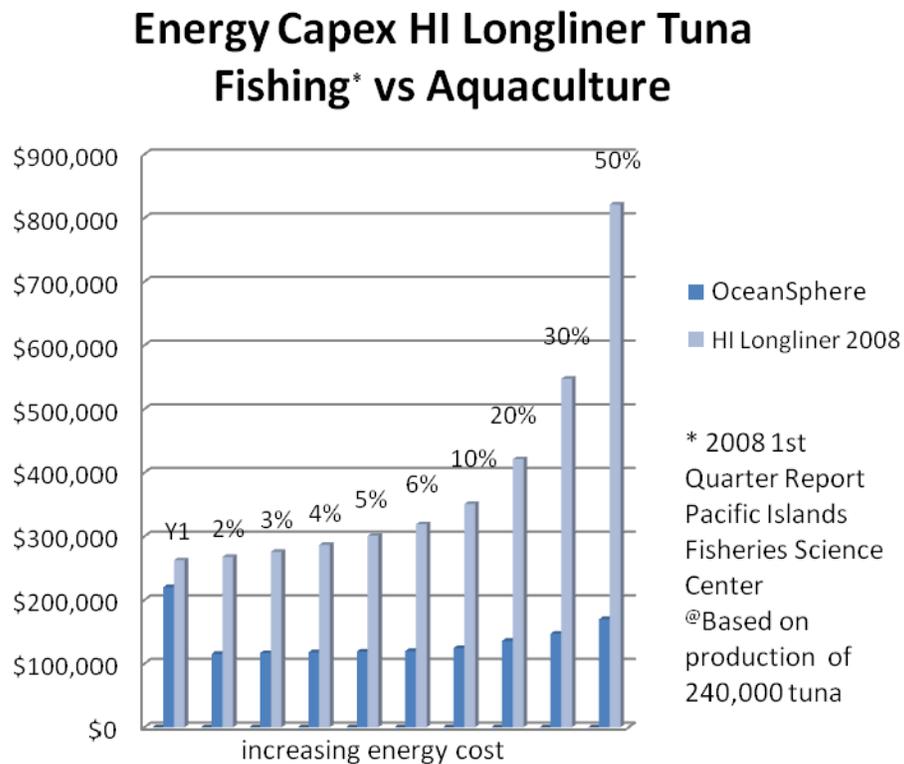
2.8 AIR QUALITY

2.8.1 Affected Environment

Introduction/Region of Influence

The Proposed Project will contain Ahi for grow out in the Oceansphere. This approach is superior to conventional methods of fishing and trolling for tuna as it has a smaller carbon footprint. Aquaculture burns less fossil fuels and saves on the amount of carbon dioxide released to the Atmosphere. Figure 2.8-1 is an energy capital expenditure analysis of tuna aquaculture verses 2008 Hawaii tuna longliner fishing boats.

Figure 2.8-1 Energy capital expenditure analysis of fishing and aquaculture



The ROI 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.

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 ROI is typically a limited area within a short

distance of any of the operation area boundaries, which is primarily Kawaihae Commercial Harbor (Figure 1-2) and the Proposed Action site off Malae Point (Figure 1-1) and the Alternative 2 site off Keāhole Point (Figure 1-10).

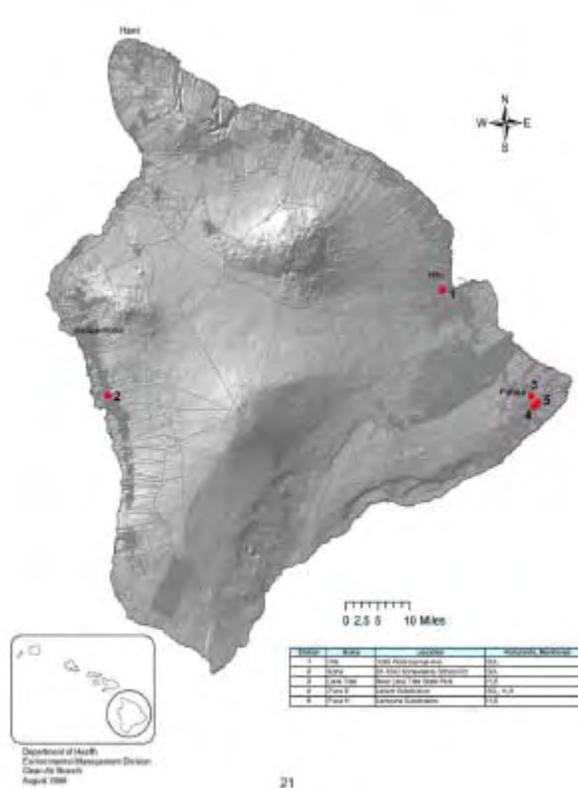
Resource Overview

To measure existing air quality, the state and the USEPA maintain a network of monitoring stations throughout the islands of Hawai'i (Figure 2.8-2). These stations are generally located where there may be air quality problems, so monitoring usually occurs in or near urban areas or close to specific large air pollution sources. Other stations in more remote locations provide an indication of regional air pollution levels. Based on monitoring information collected over a period of years, the state and federal agencies designate regions as being attainment or nonattainment areas for particular air pollutants. Attainment status is therefore a measure of whether air quality in an area complies with the National Ambient Air Quality Standards (NAAQS). The state of Hawai'i is in attainment for all criteria pollutants because all measured pollutant concentrations are well below the applicable standards (Table 2.8-1).

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).

Hawai'i's climate and meteorology play a critical role in maintaining Hawai'i's air quality. Hawai'i is the only state surrounded by the ocean and the only state within the tropics. Almost half of the area of Hawai'i is within five miles of the coast, and the remaining half lies above an elevation of 2,000 feet. These topographic and oceanic influences result in very diverse climatic conditions. In general, the climatic regions of each island differ with respect to exposure to the prominent trade winds that generally flow east to west, and the influence of terrain that produces upslope winds during the morning and downslope winds in the evening. Major storms usually occur from October through April and are generally accompanied by heavy rains and strong winds.

Figure 2.8-2. Air Quality Monitoring Stations on the Island of Hawai'i.



Source: 2005 Annual Summary Hawai'i Air Quality Data, State of Hawai'i, DOH, Clean Air Branch

Table 2.8-1
Ambient Air Quality Standards for US EPA Criteria Air Pollutants

Air Pollutant	Hawai'i (State Ambient Air Quality Standards)	Federal (National Ambient Air Quality Standards)
Carbon Monoxide		
1-hour ^(a)	9 ppm	35 ppm
8-hour ^(a)	4.4 ppm	9 ppm
Nitrogen Dioxide		
Annual	0.04 ppm	0.05 ppm
Sulfur Dioxide		
3-hour ^(a)	0.5 ppm	--
24-hour ^(a)	0.14 ppm	0.14 ppm
Annual	0.03 ppm	0.03 ppm
Ozone		
1-hour	-- 0.08 ppm ^(a)	0.12 ppm
8-hour		0.08 ppm ^(f)
PM ₁₀		
24-hour	150 µg/m ³ ^(a)	150 µg/m ³ ^(e)
Annual	50 µg/m ³	50 µg/m ³ ^(b)
PM _{2.5}		
24-hour	--	65 µg/m ³ ^(e)
Annual	--	15 µg/m ³ ^(d)
Hydrogen Sulfide		
1-hour	35 µg/m ³ ^(a)	--

Source: State of Hawai'i, Department of Health, Clean Air Branch 2005

Note: Most state standards are converted from micrograms per cubic meter (µg/m³) to parts per million (ppm).

All values not to be exceeded except as noted:

^(a) Not to be exceeded more than once per year

^(b) Attainment based on 3-year average

^(c) Attainment based on 3-year average of the 99th percentile of 24-hour PM₁₀ concentrations

^(d) Attainment based on 3-year average of annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors

^(e) Attainment based on 3-year average of the 98th percentile of 24-hour PM_{2.5} concentrations

^(f) Attainment based on 3-year average of the 4th highest daily maximum 8-hour ozone concentration.

The annual Hawaiian climate is characterized by two seasons: the winter storm months and the summer months. The temperature range between the warmer summer months and winter months is slight—less than 9° Fahrenheit (F) at any location in Hawai'i below 5,000 feet elevation, usually between 75° F and 85° F. Rainfall is much more variable. While the annual average rainfall in Hawai'i is about 70 inches, the leeward coastal areas receive less than 10 inches of rainfall, while the mountainous areas can receive up to 240 inches.

On days of strong trade winds - predominantly over winter - a general northerly wind pattern results in negligible levels of vog. On days of weaker trade winds - generally more frequent over summer - a more southerly air flow brings vog-laden air from Kīlauea volcano on a southerly air stream, created by the adiabatic convection currents along the lee of the island. Usually the air is clear, dry and cooler in the mornings, with offshore winds predominating.

The five air quality stations on Hawai'i monitor sulfur dioxide and hydrogen sulfide concentrations. These are the only two criteria pollutants deemed necessary for monitoring by the US EPA. The primary source of both of these pollutants is volcanoes. Only the Puna E station located in proximity to the currently erupting Kīlauea volcano exceeded state air quality standards for any monitored pollutant at any time during 2005. Puna E exceeded the one-hour hydrogen sulfide occurrence once in August 2005. Hawai'i air quality continues to be one of the best in the nation, and criteria air pollutant levels remain well below state and federal ambient air quality standards (DOH 2005).

2.8.2 Environmental Consequences

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 actions would not result in new emission source types or change the types of activities, OOA operations would increase the number of vehicles associated with operations compared to the current levels.

Factors Considered for Impact Analysis

Factors considered in determining whether the proposed action would have a significant impact on air quality 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.

Summary of Impacts

Table 2.8-2 summarizes impacts on air quality. The Proposed Action, Alternative 2, and cumulative effects would not likely have any significant adverse impacts that are not mitigable to less than significant. As further discussed in Section 2.8.3, baseline air quality conditions are not determined to be substantial. The no action alternative would not augment these effects; therefore, there is no anticipated impact.

**Table 2.8-2
Summary of Potential Air Quality Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Fugitive Dust from Vehicles	○	○	○	○
Emissions	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

⊗ = Significant impact	+ = Beneficial impact
⊖ = Significant but mitigable to less than significant impact	N/A = Not applicable
⊙ = Less than significant impact	
○ = No impact	

Proposed Action – Malae Point

No Impacts

Fugitive Dust. Operations for the Proposed Action will increase the local traffic within the harbor by approximately 25 vehicles from the equivalent of 22 full-time personnel and the four large pickup trucks. An additional 25 vehicles operating on the roads will have a negligible impact on air quality within the ROI. Following local driving rules and remaining on paved areas will also contribute to no impacts.

Emissions. An additional 25 vehicles and any boats used for operations will not produce enough emissions to violate ambient air quality standards. The harbor and the leased area of ocean for the OOA are in open areas, and any emissions would be dispersed by prevailing trade winds over the open ocean. The proposed project would have no impacts on air quality as a result of construction activities.

Alternative 2 – Keāhole Point

No Impacts

Impacts under Alternative 2 are similar to impacts under the Proposed Action. The number of vehicles and boats used for Alternative 2 are identical to the Proposed Action and will not produce enough dust or emissions to violate ambient air quality standards and there will be no new construction as part of Alternative 2. There will be no impacts.

Alternative 3 - No Action

No Impacts

The no action alternative would not change or augment the level of fugitive dust and vehicle emissions. No impacts are identified as a result of the no action alternative.

2.9 SOCIOECONOMIC CONDITIONS

2.9.1 Affected Environment

Introduction/Region of Influence

Hawaii Oceanic Technology is involved with the local population in many endeavors in both the private and commercial sectors.

Partnerships: Hawaii Oceanic Technology has working relationships in research and technology development in the form of proposals and contracts 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.

The socioeconomic indicators used for this study include regional economic activity (business activity, employment, and income), population, housing, and schools. These indicators help to characterize the ROI. For the purpose of this analysis, an ROI is a geographic area selected as a basis on which social and economic impacts of project alternatives are analyzed. The ROI includes 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 ROI 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.

Resource Overview

Population

Based on the HDBEDT analysis of the most recent population estimate released by the US Census on March 22, 2007, population growth in the state of Hawai'i has been stable over the last seven years (2000-2006), after seven years of below one percent growth (1995-2001). Leading the growth in population from 2005 to 2006 was Hawai'i County, with a growth rate of 2.8 percent, followed by Maui County (+1.2%), and Kauai County (+1.0%); Honolulu County grew the least, at 0.6 percent (HDBEDT 2007b). The growth of Hawai'i County (Island of Hawai'i) population in recent years was partly due to the fact that more people move to this island from other islands in the state and from the US mainland. An average of 2,805 more people moved (from foreign, US mainland, or Hawai'i neighbor islands) to the Island of Hawai'i per year than those moved from the island during the 2000-2006 periods (HDBEDT 2007b).

As shown in Table 2.9-1, the population of the state of Hawai'i increased by 9.3 percent between 1990 and 2000. This compares to a 23.5 percent growth rate for Hawai'i County during the same period. Hawai'i County's population increased by 15.1 percent between 2000 and 2006. For comparison, the population of the state of Hawai'i increased by 6.1 percent during the same time period (Table 2.9-1).

Table 2.9-1
Population Trends for the State and County

	1990	2000	2006	% Change 1990-2000	% Change 2000-2006
Hawai'i State	1,108,229	1,211,537	1,285,498	9.3	6.1
Hawai'i County (Island of Hawai'i)	120,317	148,677	171,191	23.5	15.1

Source: HDBEDT 2007b

Economy, Employment, and Income

In the fourth quarter of 2006, Hawai'i County added 2,450 wage and salary jobs, a 3.7 percent increase from the fourth quarter of 2005. The state government added the most (500 jobs), followed by natural resources, mining, and construction (400 jobs), retail trade (300 jobs), transportation, warehousing, and utilities (250 jobs), and food services and drinking places (200 jobs). The agriculture sector lost 50 jobs (HDBEDT 2007a).

Table 2.9-2 presents the distribution of employment for Hawai'i County among the various industry sectors and the changes experienced in these sectors between 2005 and 2006. The government, retail trade, accommodation, and health care and social assistance sectors employed the greatest number of workers in Hawai'i County in 2006. Most of the sectors experienced an increase in the number of employment except for the farm industry, which lost 6.1 percent of employment in one year.

Table 2.9-2
Economic Indicators for Hawai'i County

Sector	Hawai'i County	
	Number of Persons, 2006	% Change Year Ago
Total employment	81,350	2.9
Total unemployment	2,550	3.3
Farm employment	2,300	-6.1
Nonfarm employment	64,150	3.4
Transportation, warehousing, and utilities	3,050	7.0
Manufacturing	1,500	3.4
Natural resources, mining, and construction	5,150	6.2
Wholesale trade	1,750	6.1
Retail trade	9,200	3.4
Information	650	0.0
Financial activities	2,750	5.8
Professional and business services	4,950	4.2
Educational services	1,000	5.3
Health care and social assistance	6,000	1.7
Arts, entertainment, and recreation	1,600	3.2
Accommodation	7,200	1.4
Food services and drink places	5,450	3.8
Other services	2,000	0.0
Government	11,950	3.0

Source: HDBEDT 2007a

In 2006, the ROI civilian labor force totaled 83,850, with 81,350 employed and 2,550 unemployed. The average annual unemployment rate for the ROI was 3.0 percent in 2006, higher than Hawai'i's state average annual unemployment rate of 2.6 percent (HDEBDT 2007a).

The per capita personal income of the ROI was \$25,096 in 2004¹ (HDEBDT 2005). This was lower than the state of Hawai'i's per capita personal income of \$32,625 (HDEBDT 2005). Personal income in the sector of forestry, fishing, related activities, and other declined by 15 percent between 2001 and 2004 (HDEBDT 2005).

Fish Industry

In the commercial fish industry, the annual fish catch in the state of Hawai'i for yellowfin (Ahi) declined by 29 percent between 2003 and 2004 (3,129,477 to 2,219,343 pounds [1,419,507 to 1,006,677 kilograms]) and increased by 48 percent between 2004 and 2005 (2,219,343 to 3,286,472 pounds [1,006,677 to 1,409,719 kilograms]) (HDBEDT 2005).

¹ Per capita personal income was computed using Census Bureau midyear population estimates. Estimates for 2000-2004 reflect county population estimates available as of April 2006. Source: US Bureau of Economic Analysis 2006

Housing

Housing units in the state of Hawai'i increased by 6.3 percent between the years 2000 and 2005, from 461,693 to 491,071 units. During the same period, housing units increased by 14.2 percent in Hawai'i County, from 63,023 to 71,984 units (HDBEDT 2007c).

In 2005, 17.3 percent (12,514 units) of the housing units in Hawai'i County were vacant. For the same year, housing units occupied by renters formed 32.8 percent of the total occupied housing units (US Census 2005).

Schools

The HDOE, headquartered in Honolulu, oversees public primary and secondary schooling for the state, with 285 schools located throughout the islands. The ROI is divided into 10 school-complex areas, with a total of 56 schools, including 12 charter schools, 2 adult education schools, and 8 high schools (HDOE 2007).

Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. Environmental justice is analyzed to identify potential disproportionately high and adverse impacts to minority and low-income populations from proposed actions and to identify alternatives that might mitigate the impacts.

The ROI has fewer individuals reporting to be Black or African American or American Indian and Alaska Native than the state of Hawai'i or the United States but a higher percentage of Asians than the state of Hawai'i or the United States. The percentage of Native Hawaiian and other Pacific Islanders is higher than the state of Hawai'i and the United States as a whole. The percentage of Hispanics or Latinos in the ROI is higher than the state of Hawai'i but lower than the United States as a whole (Table 2.9-3).

Table 2.9-3
Race, Ethnicity, and Poverty Status for Hawai'i County,
State of Hawai'i, and the United States (2005)

	Hawai'i County	Hawai'i State	United States
White	34.9%	24.9%	74.7%
Black or African American	0.7%	2.0%	12.1%
American Indian and Alaska Native	0.1%	0.3%	0.8%
Asian	23.5%	42.0%	4.3%
Native Hawaiian and other Pacific Islander	9.0%	8.5%	0.1%
Hispanic or Latino ¹	11.7%	8.0%	14.5%
Other	2.2%	1.3%	6.0%
Two or more races	29.6	21.0	1.9%
Persons living in poverty	13.2%	9.8%	13.3%

Source: US Census Bureau 2005a, 2005b, 2005c.

¹Persons of Hispanic origin may be of any race.

The Census Bureau bases the poverty status of families and individuals on 48 threshold variables, including income, family size, number of family members under the age of 18 and over the age of 65, and amount spent on food. In 2005, approximately 13.2 percent of the Hawai'i County residents were classified as living in poverty, higher than for the state of Hawai'i and almost similar to the United States as a whole.

Protection of Children

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, April 1997, seeks to protect children from disproportionately incurring environmental health risks or safety risks that might arise from federal policies, programs, activities, and standards. Environmental health risks and safety risks to children are those that are attributable to substances that a child is likely to come into contact with or to ingest.

The Ahi Aquaculture Project would operate in the ocean, Kawaihae Commercial Harbor, and Hilo Harbor. All of these areas are off limits to children, unless accompanied by an adult.

2.9.2 Environmental Consequences

Impact Methodology

The ROI for the proposed action was defined as Hawai'i County (Island of Hawai'i). Alternative 1, Alternative 2 and the no action alternative are reviewed and evaluated to identify potential impacts (beneficial or adverse) on conditions in the ROI. For the proposed action, impacts on population, employment, income, business volume, housing, and schools were evaluated qualitatively.

Factors Considered for Impacts Analysis

Factors 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.

Summary of Impacts

Table 2.9-4 summarizes impacts on socioeconomics. Alternative 1 and Alternative 2 would have beneficial effects on the local economy, with increases in employment, income, and

business sales volume from the Ahi Aquaculture Project. Environmental Justice will be impacted positively by the availability of jobs at all educational levels.

Table 2.9-4
Summary of Potential Socioeconomic Impacts

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Population, Housing, and Schools	○	○	○	○
Economy, Employment, and Income	+	+	+	○
Environmental Justice	+	+	+	○
Protection of Children	○	○	○	○

In cases when there would be beneficial and adverse impacts, both are shown on this table.

LEGEND:

⊗ = Significant impact	+ = Beneficial impact
⊙ = Significant but mitigable to less than significant impact	N/A = Not applicable
⊕ = Less than significant impact	
○ = No impact	

Proposed Action – Malae Point

Beneficial

Economy, Employment, and Income. Hawaii County's economy will be positively impacted by job creation, diversification and increased revenues. 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 alone. In 2005, total annual fish catch for yellowfin Ahi in the state of Hawai'i was approximately 1,000 tons (HDEBDT 2005). Hawaii Oceanic Technology is planning to supply only 10 percent of the local market with the open-ocean raised yellowfin tuna to educate customers of hotels and restaurants about the qualitative characteristics of the clean ranching conditions of the raised yellowfin tuna. Hawaii Oceanic Technology's target market is the US mainland and Japan, where the selling prices would be twice as profitable as the local market. Therefore, the Proposed Action could have no impacts on the local market. The fish farming operations will most directly impact the local economy through employment, secondary support industries, and product availability. The Proposed Action will support other local businesses that will supply the wide variety of services and materials necessary to build and maintain the operations.

The Proposed Action will directly contribute to local employment, with 22 full-time equivalent positions, including 10 ocean operations personnel. Based on the input-output model prepared by the HDBEDT for the state of Hawai'i, the job multiplier for the proposed Hawaii Oceanic Technology project is 21 jobs for every 10 direct employees (Bahar 2006). The input-output model is an economic development tool that helps predict how changes in one industry's final demand, employment, and income can affect the rest of the economy. The input-output multiplier determines changes in total output employment and income levels in the entire economy (HDBEDT 2007d). Based on the input-output

multiplier, it is expected that the proposed Hawaii Oceanic Technology project will add 46 indirect jobs in addition to the 22 direct full-time positions. As such, this project would have beneficial impacts on the overall employment in the ROI and would offer opportunities for alternative employment for fishermen.

Indirect beneficial effects to the ROI would be to revitalize Hawai'i's reputation as a source of high quality, sashimi-grade tuna. The greatest public benefit to be gained from this project is probably in creating the commercial incentive for further research and increased infrastructure for hatchery production of marine fish.

The Proposed Action could also indirectly benefit local farmers. Hawaii Oceanic Technology will consider supplementing the fish-based feed with soy protein and/or algae supplied by local farmers to eventually reduce the need for acquiring feed from outside Hawai'i.

Environmental Justice. Beneficial impacts are expected on minority and low-income populations as a result of the Proposed Action, as new jobs will become available at all educational levels. Local contractors will benefit from new business as well. As noted earlier, Hawaii Oceanic Technology is planning to supply, only ten percent of the current local tuna market needs with the open-ocean raised yellowfin tuna and this would not affect the local market of commercial fish sales by local fishermen. Hawaii Oceanic Technology's target market is the US mainland and Japan. As such, impacts on the local fishermen are not expected.

No Impact

Population, Housing, and Schools. No impacts on population, housing, and schools are expected as a result of this alternative. This project would not result in a significant increase in the local population, and therefore, would not increase the demand on housing and schools.

Protection of Children. No impacts on children would be expected. The proposed project location would be in the open ocean or inside facilities at Kawaihae Harbor or Hilo Harbor. These harbor facilities are fenced and off limits to children, unless accompanied by an adult. The ocean is accessible only by boat, where children would be accompanied by an adult.

Alternative 2 – Keāhole Point

Impacts under Alternative 2 are similar to impacts under the Proposed Action. There would be less than significant impacts on the economy, employment, income, and environmental justice and no impact on population, housing, schools and protection of children. Project operations would be run in the same manner as with the Proposed Action and the open ocean base operations at Keāhole Point, both of which are within the same county.

Alternative 3 - No Action

Under the no action alternative, conditions would remain unchanged; therefore, no impacts on socioeconomic conditions, environmental justice, and the protection of children are expected.

2.10 EMERGENCY SERVICES AND HUMAN HEALTH AND SAFETY

2.10.1 Affected Environment

Introduction/Region of Influence

The following section addresses emergency services and human health and safety within the ROI. The ROI can be defined as the project area itself.

Resource Overview

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

Existing Conditions of Personnel

The majority of personnel who would be employed as part of the Proposed Action or Alternative 2 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.

Existing Conditions of Project Setting

SCUBA Diving Risks. 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 alternaobaric vertigo, altitude sickness, barodontalgia, decompression sickness (known as “the bends”), dysbaric osteonecrosis, embolism, arterial gas embolism, cerebral embolism, lung expansion injury, pneumomediastium, pressure arrhythmias, tinnitus, Eustachian and inner ear damage, and Tympanic membrane rupture and/or hearing loss (SCUBA Guide 2007).

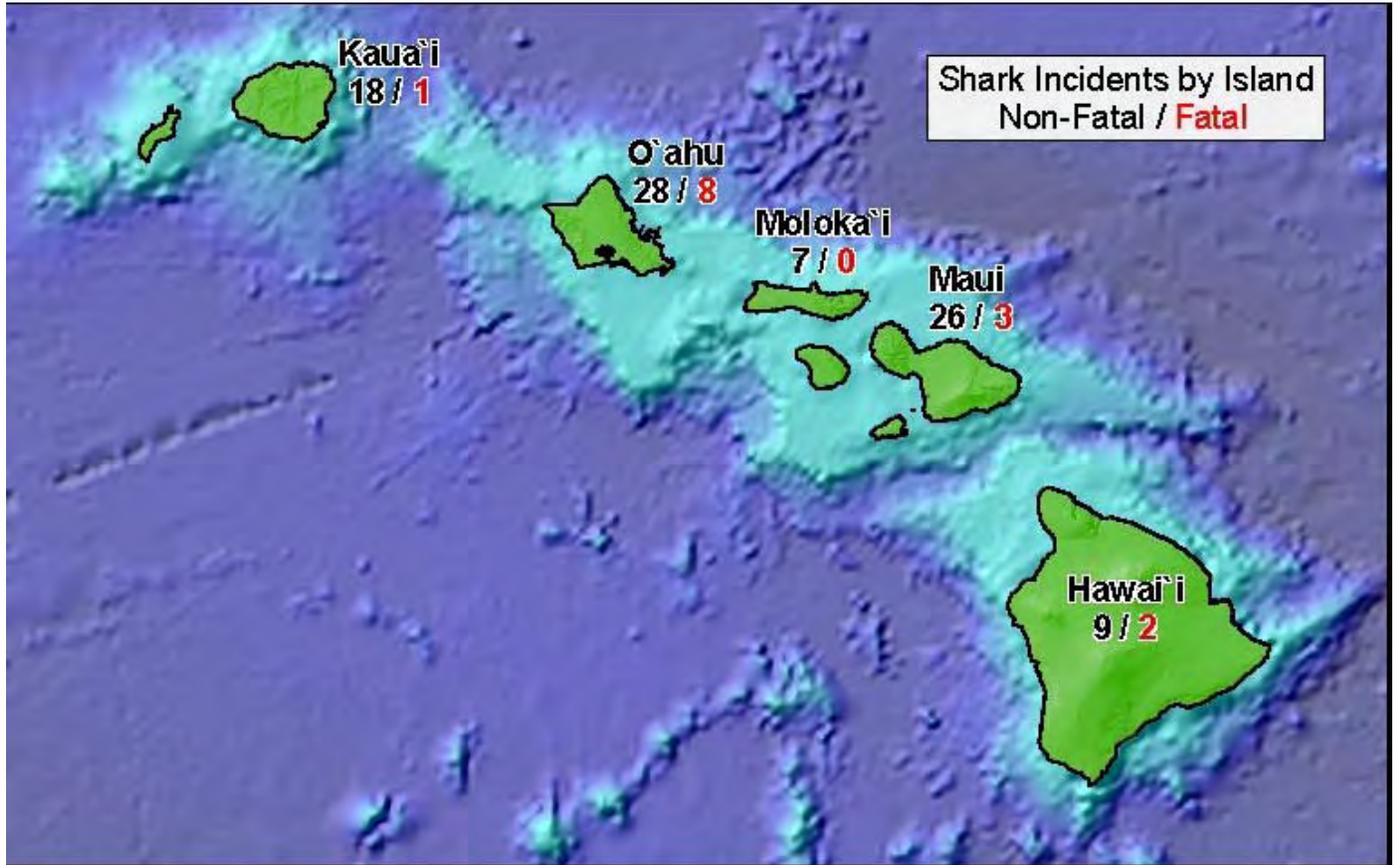
Non-barotrauma risks include carbon dioxide toxicity (hypercapnia), nitrogen narcosis (known as “rapture of the deep”), and oxygen toxicity (SCUBA Guide 2007).

Physical and health hazards include dangerous marine life (e.g., jellyfish), 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.

Shark Incidents. 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). As shown in Figure 2.10-1, less than nine shark incidents have occurred off of the Island of Hawai'i since

Figure 2.10-1. Map Showing Number of Shark Incidents by Island, 1900-2004



Source: DAR 2007

1990, with two resulting in fatalities (DAR 2007a, DAR 2007b). There have been no reported shark incidents since 2004 in the waters off the Island of Hawai'i (DAR 2007b). The Proposed Action would occur in deep waters three miles from shore, while almost all reported shark incidents occur in shallow coastal waters.

Tsunamis. The Oceansphere will operate in water depths of 1329 feet. Since waves break in water depths of one half its wavelength, it would take a 2000 foot Tsunami to affect the Oceansphere within the Ocean Lease Site. Tsunami is "harbor wave" in Japanese, termed after fisherman returning to their harbor after a day out fishing found their town destroyed by a tsunami, they had not detected it while out at sea outside the harbor. Because tsunamis have a long wavelengths and they only cause a small rise in sealevel as they pass a vessel out at sea, therefore the Oceansphere will not likely be affected by a "normal" sized Tsunami. If tsunami is detected or reported, the people working at the platforms will be evacuated and removed.

Emergency Services. Per State of Hawai'i's Act 54, effective January 1, 2004, all vessels more than one mile offshore must have an Electronic Position Indicating Radio Beacon

(EPIRB) or Very High Frequency (VHF) radio on board. The State of Hawai'i Division of Boating and Ocean Recreation (DOBOR) also requires that:

All commercial vessels must report casualties (capsizing, grounding, falls overboard or on board, or other injuries incurred while aboard a vessel) to the Coast Guard per federal regulations applicable to the vessel. Commercial vessel casualties must be reported to the Coast Guard as soon as possible after the occurrence. The casualties that must be reported are described in the federal regulations applicable to the type of commercial operation. Commercial vessels must contact the US Coast Guard Marine Safety Office at (808) 541-2070. For neighbor islands, contact a police officer or the Division of Boating and Ocean Recreation District Office or US Coast Guard Unit (DOBOR 2007).

DOBOR's Island of Hawai'i District Office can be contacted at (808) 329-4997.

In cases of diving injuries, shark incidents, or other nautical emergencies, one of the following should be contacted: the US Coast Guard at (808) 541-2450, emergency services at 911, or the State of Hawai'i Department of Conservation and Resource Enforcement (DOCARE) at 643-DLNR (643-3567). The closest emergency care clinic to the Proposed Action site is at the 2,500' elevation mauka of Kawaihae in the town of Waimea at the North Hawaii Community Hospital located at 67-1125 Mamalahoa Hwy., Kamuela, HI 96743, telephone (808) 885-4444. The closest emergency care clinic that is near sea level is at Hualalai Urgent Care located at 75-1028 Henry St #101, Kailua Kona, HI 96740, telephone (808) 327-4357. An alternative emergency care clinic is Keauhou Urgent Care Center, located at 78-6831 Ali'i Dr #K9, Kailua Kona, HI 96740, telephone (808) 322-2544. If a SCUBA diver is suffering from "the bends," then hyperbaric oxygen treatment should be sought. A hyperbaric chamber is available in Honolulu at Hyperbaric Medicine Center located in the Nimitz Business Center at 1130 N. Nimitz Highway, Suite A-140, Honolulu, HI 96817, telephone (808) 545-1909.

2.10.2 Impact Analysis

Environmental Consequences Impact Methodology

In evaluating the possible effects on emergency services and human health and safety within the ROI, the protocols of DOBOR and the USCG have been reviewed, as have SCUBA safety and the risk of shark incidents. Factors 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 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.

Summary of Impacts

Table 2.10-1 summarizes emergency management impacts.

**Table 2.10-1
Summary of Potential Emergency Management Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Dive Emergency	⊙	⊙	⊙	○
Nautical Emergency	⊙	⊙	⊙	○
Tsunami	⊙	⊙	⊙	○

In cases when there would be beneficial and adverse impacts, both are shown on this table.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

Proposed Action – Malae Point

Less Than Significant Impacts

Under Alternative 1 no significant impacts on emergency services or human health and safety are anticipated. All Hawaii Oceanic Technology employees working at the fish platforms will be trained, certified, and experienced as appropriate to their tasks. A health and safety plan will be developed for all open ocean activities. The addition of an estimated 22 employees would not place a significant additional strain on existing emergency services given the substantial amount of recreation and other commercial activities that already occur within the ROI.

In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology will contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be

immediately notified. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere however, a salvage company will be called in the event the work crew can't handle the problem.

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, people working on 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 and thus a less than significant impact is anticipated.

Alternative 2 – Keāhole Point

Less Than Significant Impacts

Impacts under Alternative 2 are similar to impacts under the Proposed Action. Operations will be run in the same manner and less than significant impacts are anticipated.

Alternative - No Action

No Impacts

Under the no action alternative, there would be no impacts as no aquaculture project would be undertaken and existing conditions would not change.

2.11 CULTURAL RESOURCES

2.11.1 Affected Environment

Introduction/Region of Influence

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 (ROI) for cultural resources includes all harbor structures and facilities utilized by the Open Ocean Aquaculture (OOA) operation and the proposed leased ocean areas for the OOA operations and offshore ocean platform site. In addition to the ROI, the cultural history of the land on the shore adjacent to the Proposed Action site in North Kohala known as Pu'u Ulaula was researched to identify patterns of cultural activity, and identify native Hawaiian families and other kama'aina with historical associations with the land and adjacent sea. No new structures will be constructed at the harbors for the purpose of this project. This project will utilize existing facilities and structures within the harbors.

Native Hawaiian Traditions and Resources

Native Hawaiian's ancestors were the first discoverers of the Hawaiian archipelago, and they continued to inhabit these islands for thousands of years prior to Western contact. Native Hawaiians continue to maintain their strong cultural ties to the lands and seas, as documented in their oral and written histories, mythologies, genealogies, proverbs, songs and dances, and present day voyaging practices. Prior to Western contact, Native Hawaiians sailed the waters of the Hawaiian archipelago in long-distance double-hulled voyaging canoes exploring, colonizing, and in some cases settling these remote islands.

The ocean played an important role to Native Hawaiians, as it was used for resources and physical and spiritual sustenance in their everyday lives. Poetically referred to as ke kai pōpolohua mea a Kāne (the deep dark ocean of Kāne), the ocean was divided into numerous smaller divisions and categories beginning from the near shore to the deeper pelagic waters (Malo 1951:25-27; Kamakau 1976:11-12). Likewise, channels between islands were also given names and served as vital connections between islands as well as a reminder to their larger oceanic history and identity.

In Hawaiian traditions, the Northwestern Hawaiian Islands and its surrounding ocean are considered a sacred place, a region of primordial darkness from which life springs and spirits return after death (Kikiloi 2006). Much of the information about the Northwestern Hawaiian Islands has been passed down from generation to generation and eventually documented.

Through these sources, Native Hawaiians are able to recount the travels of seafaring ancestors between the Northwestern Hawaiian Islands and the main Hawaiian islands and demonstrate the importance of the ocean in Hawaiian culture.

Native Hawaiian Culture and Landscapes

Archaeological and linguistic evidence indicates that the original settlers of Hawai'i brought with them from the islands of central and east Polynesia seeds, roots, corms (underground stems, as in taro), and cuttings of a variety of plants of Southeast Asian and New Guinean origin. The plants that were brought to Hawai'i had already proven capable of surviving long-distance voyaging during the millennia of settlement of the Pacific Islands and had adapted well to environmental conditions on the volcanic and coralline islands of the South Pacific. These plants include taro (kalo, in Hawaiian), the staple of the Hawaiian diet, and other plants that were important elements in the Hawaiian diet or that were useful for medicinal, ceremonial, or utilitarian purposes. Traditional economic plants that reached Hawai'i from Asia or New Guinea include, among others, coconut (niu), breadfruit ('ulu), gourd (ipu), banana (mai'a), sugarcane (kō), kava ('awa), ti (kī), and Indian mulberry (noni). Sweet potato ('uala), a native of South America, was brought to Hawai'i by later Polynesian voyagers and became one of the main crops grown in dryland areas.

Agriculture and arboriculture, fishing, hunting, bird collecting, and other uses of natural resources provided subsistence for Hawaiians and became integral and focused parts of Native Hawaiian culture. These practices also played a large part in the traditional religious system. Native Hawaiian belief states that natural objects such as rocks, plants, and animals are kinolau (forms taken by supernatural beings, including gods) (Abbott 1992; Pukui and Elbert 1986). Kāne, the great life-giver, for example, is present in kō (sugarcane) and 'ohe (bamboo); Kanaloa, the master of the sea, is present in mai'a (bananas) and in many sea creatures; Kū, associated with building and war, is present in niu (coconut), some marine animals, and trees; and Lono, the god of peace, planting, and fertility, is present in rain clouds, 'uala, and ipu (gourds) (Abbott 1992).

The land was divided into areas called ahupua'a, then into smaller divisions called 'ili 'āina that were worked by individuals or families, with areas set aside and worked for the chiefs and other ali'i (élites) (Abbott 1992). An ahupua'a ideally included all the resources necessary for subsistence, creating a system that maximized productivity and successful use of resources. In nearly all cases, an ahupua'a would have sufficient water to irrigate crops; enough upland (mauka) resources for hunting birds and collecting forest plants and building materials; and coastal (makai) access for fishing and for harvesting other marine resources. Historical and archaeological data suggest that many more families lived and farmed inland than fished and lived along the shore (Abbott 1992). Products from inland areas were exchanged among members of the ahupua'a community for products of the shore and the sea, ensuring that all resources were available to all Hawaiians.

Many archaeological sites (e.g., McAllister 1933; Sterling and Summers 1979) reflect an evolved system of resource use that included careful maintenance, sharing, and allocation of necessary resources at both the shore and inland. Shoreline fishponds (loko) were surrounded by stone walls with sluice grates that allowed fish and water to enter; in these

ponds, fish were caught, grown, and harvested, often for the ali'i. Inland, stone walls and earthen berms surrounded fields on slopes and retained soil and water in terraced agricultural plots. Irrigation ditches (‘auwai) carried water (wai) from mountain sources to irrigate pond fields (lo‘i) for many families, each allowed to use the water during specified times. The careful allotment of water and other critical resources is integral in Hawaiian law, and most researchers consider the Hawaiian word for law, k n wai, to be derived from “wai” (Pukui and Elbert 1986). According to tradition, Native Hawaiians feel a spiritual and even a genetic connection to plants, specifically kalo, as they play a large role in their creation traditions (the Kumulipo). One version of this story describes how W keka, the sky god, coupled with his daughter, resulting in a stillborn and misshapen male fetus that was buried in the earth on the east side of their house (Enos 1998). From out of the ground where the baby was buried the kalo grew, nourished by the tears of his mother. When W keka’s daughter became pregnant again, she bore the first human male, named H loa. All future Hawaiians would be related to him, and consequently related to the kalo, the plant that grew out of H loa’s stillborn brother. Many plants had multiple economic uses and were also used as offerings, again bridging the gap between subsistence and religion. Since nearly all plant species were considered kinolau (as explained, forms of supernatural beings), their uses and consumption were directed eventually, probably late in prehistory, by the kapu (taboo, proscription) system, which covered religion, social activities, exchanges, and interactions.

It was this kapu system that the Europeans encountered when they first arrived. With such direct links to plant life, much of Hawaiian religion and ceremony is centered around traditions regarding when to plant, fish, harvest, or process natural resources. This focus, incorporating the belief that “Native Hawaiian” extends beyond the human form, encompassing the natural landscape and forms of their gods held within earth, water, plants, and animals, implies that the definition of “ancestor” to Native Hawaiians includes every water source, geological characteristic, plant, insect, and animal that exists in any given area.

Native Hawaiian Culture and the Ocean

The ocean was deeply woven on a day to day basis with the life of Hawaiians throughout their history. The ocean is rich in cultural significance as embodiments of gods and goddesses, as well as the home of personal gods, or ‘aum kua. Traditional and customary practices of the ocean include many types of fishing, which were used for trolling, net fishing for ‘ pelu, bottom fishing, as well as thrownet, fishtraps and harpoon fishing from shore. Traditional use of coastal resources along the shoreline and intertidal areas also includes gathering of wana, ‘opihi, and various limu for consumption. Konohiki were those given the authority to manage the resource use in the ahupua’a, establishing boundaries, kapu seasons, to ensure good harvests for ahupua’a tenants, and the local chief.

Konohiki and the ahupua’a

Konohiki fishing rights were part of the ancient Hawaiian system of land and ocean management. Hawaiian communities depended on the sea for protein to support themselves. Under the feudal system of the time, the land and its adjacent sea were claimed by the king, who granted certain lands to high chiefs, who in turn granted certain places to lesser chiefs, in return for a portion of the products of the land and sea, as well as military

support (Kosaki, p. 1). Over time, “konohiki fishing rights” also became to mean the “chief’s or privately owned fisheries” (Kosaki 1954: 1).

Framework for Identifying Native Hawaiian Resources

Native Hawaiian resources consist of properties of traditional religious and cultural importance to a Native Hawaiian group. These include traditional cultural places/properties (TCP); prehistoric and historical (pre- and post-Contact) archaeological sites, which may include heiau (places of worship) and burial sites, traditional house sites and other gathering places, and work sites and other special-use sites; and plants and animals used for subsistence and other cultural purposes.

As defined by the NPS, TCP s are eligible for inclusion in the NRHP “because of [their] association with cultural practices or beliefs of a living community that (a) are rooted in the community’s history, and (b) are important in maintaining the continuing cultural identity of the community” (Parker and King 1990).

Throughout Hawai‘i, there are many sites that are not eligible for inclusion in the NRHP but are still considered areas of traditional importance (ATI) because they are rooted in the community’s history and are important in maintaining cultural identity. These ATI are also considered for analysis.

Overview of Hawaiian Prehistory and History

The Hawaiian Islands were settled between 100 and 800 CE from central or east Polynesia, probably from the Marquesas Islands. The greatest population expansion in the islands occurred between 1150 and 1400 CE, and archaeologists believe that during the later part of this period Hawaiian culture became quite complex. During this time, powerful lineages of high chiefs of O‘ahu and Hawai‘i were founded. Additionally, agriculture expanded and intensified during this period (e.g., Allen 1991, 1992; Allen et al. 1987; Handy and Handy with Pukui 1978; Hommon 1976, 1986; Kirch 1985).

In West Kohala area, initial settlement occurred in approximately 800 – 1000 CE. There is historical evidence of small fishing settlements along the shoreline of this region consisting of house sites, canoe hale, small gardens, walls, all connected by a coastal trail. (Bonk 1968 and Newman 1968). Fresh water was apparently very limited, but could be found in springs, water caves, dew fall and catchment to irrigate gardens. These fishing villages likely focused daily life on the ocean and used the ocean near here for fishing purposes. Significant settlement begins approximately 1400 through 1850 including permanent and temporary habitations, burials, heiau, trails, and holua. (Maly undated in UH-DURP 2005)

Legendary references to Kohala Waho are found in He Moolelo no Makalei, which was published in Ka Hoku O Hawaii from January 31 to August 31, 1928 and describes a story set in the 11th century CE about the creation of the most famous caves of the North Kona region (Ke ana wai o Makalei).

The moolelo includes information about the practices and traditional knowledge of Kohala Waho, as translated by Maly (Maly 2005 in UH-DURP 2005) including:

Po`a`aha (a type of braided fiber) was used as a racing baton. Fishing for malolo (flying fish). Fishing was regulated by season, malolo seasons ended when abi (yellow fin tuna) began. Abi fishing information: Used six ka`au (240') of `olona (woven mulberry fiber), bailers, water gourds, `ai pa`a (poi bundles), paka (sinker lines). Ko`a (proscribed fishing area) accessed using triangulation (kanlana). `Opelu is used as bait. Canoes used to fish for abi had woven sails (palaumoena) and wooden masts (kia). Kukui nut was chewed then spit on the water to enable fishermen to see the bottom. To fish the `Avini ko`a, with its Kobalapehu winds, one had to sail all the way to Hana Maui to turn around. Other winds used were the Malani and Oninipua (also known as the Kuakualao). Abi was given, traded, offered as sacrifice to ancestors and cordage, as well as cut up and dried, as well as given to villagers. The winds off of the ocean of Honopue were dangerous to fishermen. (Maly 2005 in UH-DURP 2005).

This moolelo describes the relationship between leeward and windward Kohala, translated in Maly ((2005) in UH-DURP (2005)) as follows:

Leeward (Kohala Waho) was known for its expert fishermen. Abi fishing was the major work of the leeward coast, Kohala was noted for its abundance. Abi was said to control the “moku, kalana, the ahupua`a, the ko`ele” of Kohala Waho, was sought after in all six districts of the island of Hawaii. It was understood that Aumakua Lawa`ia and Ku`ula (ancestral fishing deities) observe fishermen to make sure proper protocol is followed: to give away fish freely to all those who assist in the catching: canoe carriers, elder fishermen, cordage makers, etc. Windward Kohala (Kohala Loko) people were known to be agricultural specialists. Exchange between the two was important: in the story, Makalei’s fishing skill brought an abundance of fish, which were traded with farmers from Halawa, Makapala, Niuli`i, Waiapuka, Pololu, and Honokane. Chiefly names listed corroborate the Mamiki article inference that place names in Kohala Waho are derived from chiefs: Makalei meets chiefs named Puakea, Pu`uonale and Kokoiki on his journey to Kohala Waho. Kapa`au was the name of a racer (kukini). Kohala was noted to have four divisions, one of which was said to be the `ilima land zone of the `Apa`apa`a wind (mentioned in Makalei’s pu`a chant). Makalei competed against Kapa`au, the champion of Kukuiipahi (Chief of Kohala Loko) for the control of Kohala Waho” (Maly 2005 in UH-DURP 2005).

Place names in the North Kohala area are described in this moolelo:

“In Kohala Loko, in the uplands of Pu`uepa, was mentioned to be a center for chiefly sports. Associated with this district was a kabua le`ale`a (contest area), the playing of ke`a pua (sugar cane tassel stems), puu noa (a hide and guess game played with rocks and kapa bundles), and racing, which seems to have been an important game for the chiefs. Place names and land uses in Kohala Waho named included: Kabei, which had mo`aina (cultivate dry land parcels), `ilina wai`ole (dry waterless lands), hono (sheltered areas) and `uala pu`e (sweet potato mounds) (Maly 2005 in UH-DURP 2005)

Maly provides a translation of what the moolelo describes as ties between natural phenomena and traditional knowledge for the North Kohala area as:

Star constellations were used (Pleiades, here mentioned as Hubui, not Makali'i) to determine when to set sail on the fishing canoes, for during the high point of the rising of Hubui, "the wind blows with frequent lulls." The `Apa`apa`a winds cause waves to break in white ridges, forcing one to land at Ha`ena. The `Avini Ko`a was accessed only when the "kobalapehu" wind was not blowing for it created unusually large waves, the size of houses. The month of Kobalapehu wind was Hilina during raining season. This wind was thus known for it pelted the natives and destroyed canoes. The time to catch abi was in the months of Kaulua and Nana: it said that during this time the water is calm, birds take flight (to show where the schools are), ubu are out in abundance near the cliffside. More traditional knowledge of the months listed as it relates to fishing conditions in Kohala Waho: Kaulua was said to have had temperamental weather, rain and sun intermixed, the month of Ikuwa is a time of thunder; Nana is the time when there is no storms, when the ocean is calm. This is the ideal time to fish." (Maly 2005 in UH-DURP 2005)

Another legend Ka`ao Ho`oniua Pu`uwai no Ka-Miki, serialized in the Hawaiian language newspaper from 1914 to 1917, was set in the 12th – 13th century. This is translated in outline form in a report by Maly (Maly undated in UH-DURP 2005) stating that

Kohala waho had a large population extending from the sea to upland koai`e and mamane forests, with awa, sugarcane, banana plantations in the uplands and fishing on the coasts. Kohala was ruled by two chiefs during this time: Kapa`au-iki-a-Kalana and Hikapola. Hika often organized sporting events. The names of the characters in this story coincide with place names of Kohala waho including Hikapoloa (Alii nui of Kohala waho), `Upolu (pukaua or general), Honoipu (`alapa or competitor in athletic contests), Ho`ea (kukini or runner), Puakea (koa or warrior), Kukuipahu (wife of Hikapoloa), Ha`ena, Aivalua, Kapa`a Kaipuha`a, and Pui`epa (olobe or lua warriors and lesser chiefs), Kabua and Kai`opae (Chiefs and guardians of Lamaloloa), Lamaloloa (Master competitor and fighter for Hikapoloa), and Kepaka ili`ula (child of Hikapoloa and Kukuipahu) (Maly, undated) in UH-DURP 2005.

A Preliminary Chronology of North Kohala in the UH DURP 2005 North Kohala Coastal Cultural Resource and Heritage Landscape Study provides a description of the legendary past related to this area taken from Tomonari-Tuggle 1988: 8-9):

Papa and Wakea are considered the residence of Oakea and Opapa (Wakea and Papa)... the god and goddess who made Hawaii and all the others of this group of islands (in Damon 1927: 54). Pa`ao is credited with the establishment of a new political and religious order, which set severe sanctions for religious observance emphasizing the separation of chief and commoner. Pa`ao brought with him Pili-Kaiaea, a Tahitian chief, to rejuvenate the royal Ali`i line. This line of chiefs, from which the Kamehameha dynasty emerged is one of the three lines of descent through which Hawaiian ali`I traced their genealogies; the other two are the `Ulu and Nana`ulu lines (Malo 1951: 6). Pa`ao is also credited with the construction of the Mo`okini Heiau at Pu`uepa. (UH-DURP 2005).

A Preliminary Chronology of North Kohala in the UH DURP 2005 North Kohala Coastal Cultural Resource and Heritage Landscape Study provides a description of early settlement for this area:

Initial utilization, probably by a small founder population, is characterized by a short-term or transient occupation mainly near richer subsistence resources, primarily along the coast. Dispersed and spaced pattern of isolated coastal communities as a result of exploiting the best-unoccupied environments. It is suggested that initial settlements occurred in maximum resource zones such as the kula gulches. A description of the leeward coast is given for this time by Rosendahl (1972: 445): "...from sea level to about 1300 feet in elevation (10 to 40" annual rainfall), the setting was an arid to semi-arid rocky slope dominated by pili grass... to the virtual exclusion of most other flora species. The upper portion of Lapakahi, extending up to about 1800 feet, probably corresponded to the lower limits of an open, mixed dryland forest, which dominated the further mauka leeward slopes of the Kohala Mountains. Narrow fingers of forest would have extended further makai, below the general forest limits, in the relatively moister gulches and gully channels (cited in Tomonari-Tuggle: 12-13). A sequence of occupation for the leeward coast of North Kohala has been offered by Tuggle and Griffin (1973: 61, 63):

Between c. AD 1450-1500 two major events occurred: an expansion in the upland area and the development of dryland agriculture; and construction of the "Great Wall" and adjacent platforms in the hamlet of Koaie. These events were interpreted as indicators of the development of Lapakahi as a distinct social and political unit with distinct social classes and consolidated power. By c. AD 1600, settlement was expanding along the coast in conjunction with intensification of the upland field systems. Tuggle and Griffin (1973: 63) attribute the expansion of settlement, and the intensification of marine resource exploitation and upland agriculture, to the demand of a stratified social system. By AD 1778, resource production had reached its peak and the population began to decrease. Much of the upland agricultural system and coastal habitations outside the hamlet were abandoned by the early 1800s. (UH-DURP 2005)

Kirch (1994) says that as Hawaiians left the windward valleys and moved to more arable lands, these field systems became of primary importance. The Kohala field system developed over about a 350-year period, from A.D. 1450 -1800, and was followed by a rapid collapse and abandonment after European contact (Kirch 1994).

Bill Bonk did an archeological survey of the coastline from Kawaihae to Mahukona in 1968. In describing the area of Pu'u Ulaula, he describes two major bays in the area with evidence of more houses - one at Waiakailio Bay (at the southern end of the Pu'u Ulaula region of coast), and another bay to the north, which was probably Waiwaionu Bay at Puaiki and Puanui ahupua'a.

Waiakailio Bay undoubtedly was an important settlement in the prehistoric as well as historic period. Prehistoric house sites, canoe sheds and other remains of ancient man are

interspersed with the remains of more recent activity. A windmill for pumping water from a well is still to be seen there together with the more recent foundation for a gasoline driven motor pump. This bay was undoubtedly a fairly important location for the shipping of cattle. (Bonk 1968: 21)

“Many of these small coastal indentations might readily have served as loading points for the shipping of cattle.” (Bonk 1968: 31). Bonk describes a typical house site in the area or Waiakailio Bay as

Two cairns within the walled yard probably resulted from the piling up of rock in the clearing of the yard. The yard itself is divided into a lower and upper portion. This results from a north-south wall through the yard. Probably the lower western section was used for planting. Two walled enclosures in the southwestern portion of the site, one 15 feet by 15 feet, the other 11 feet by 13 feet may have been used as pens. Another platform at the far southwestern portion of the site probably was also used as a kalua. (Bonk 1968: 28).

Bonk also mentions numerous canoe sheds associated with house sites (Bonk 1968).

Bonk does not mention anything at Malae Point itself. But, going further north, Bonk discovered a small bay with remains of several houses, burials, canoe houses. This was probably Waiwaionū Bay at the Puaiki and Puanui ahupua‘a. Bonk notes that

At a small bay north of Malae Point is an excellent landing place for canoes. Numerous stone walled structures and a few scattered rock graves are found in and around the bay. Pieces of coral are scattered on these graves.

There are numerous small inlets along this coast, many with small coral pebble beaches. This coastal region contains some very excellent fishing grounds. Uhu (Parrot fish) are especially numerous along this coast. Fishing certainly must have been one of the important reasons for settlement along this coast in prehistoric times. Little change has been noted in this regard, for during our three week period in the field, not one day passed without seeing at least one fishing boat offshore. Shore fishermen were also in abundance and the remains of their sojourns litter the coast with the cultural debris of our modern age. Another reason for attracting temporary or permanent residents to this area was the protection afforded by the Kohala mountains to the coastal region of the southern part of north Kohala. I was told on more than one occasion that the area between Waiakailio Bay and the point south of Keawenula Bay is normally well protected even during those periods when coastal areas to the north and south have heavy winds, resulting in choppy seas. The southern section of north Kohala coast however, normally is protected by the trade winds. The sea is therefore relatively calm during a good portion of the year and as a result this is an area where small boats might normally heave to if threatened by high seas. (Bonk 1968: 36-37)

Coastal dwellers harvested the sea in a variety of fisheries, and they grew plants using what limited fresh water they could obtain. And they depended on trade with the mauka dwellers

who would trade meat and produce for fish (Ho‘opai 2008, Akau 2008). To the North of Malae Point is the bay of Waiwaionū, which is very well protected bay. Puaiki ahupua‘ is adjacent to Kī‘iokalani. In the next ahupua‘ to the north at Puanui, there was a larger settlement here as indicated by the substantial historic remains described by Bonk (1968).

Descriptions of early fishing and farming on Hawai‘i Island in 1778 provided by Newman (1968) present data indicating that the maximum depth to which the Hawaiians were able to fish was 1,200 feet (350 meters) below the surface; the water area of the Hawaiian Islands of depths less than this figure is extremely limited (Newman 1968). There are only about 500 square miles (800 square kilometers) of inshore waters surrounding Hawaii Island less than 600 feet (200 meters) in depth (Bryan 1954:4). If the slope from the 600 feet to the 1,200 foot contour is about the same as from 0 to 600 feet the maximum ocean area usable for sub-surface angling around Hawaii Island is roughly 1,000 square miles (1,600 square kilometers). (Newman 1968)

Newman opines that “the actual area exploited by native fishermen would undoubtedly have been greatly less because of bottom conditions, water currents, swell systems, and inadequate habitat conditions to support the types of marine life normally exploited by the Hawaiians.” (Newman, 1968: 11-12)

Newman described the marine biota as follows:

“the effect of this geological feature on the marine biota is seen in the division of the waters surrounding the Hawaiian Islands into three basic habitat types: the pelagic, benthic, and inshore or reef area, each with its characteristic fauna. The pelagic habitat, quite uniform in temperature and salinity, ranges from the surface to perhaps 600 feet (200 meters) in depth and is located in the open sea offshore from the Islands (Gosline and Brock 1965: 6). Comparatively few species of fish are found in the pelagic habitat and those exploited by the Hawaiian were surface feeding carnivores such as malolo, ‘ahi, aku, ono, mahimahi, and kaku. There is also an inshore pelagic (neritic) zone, defined by Gosline and Brock (1965:7) as the upper water layers where the total depth is less than 600 feet (200 meters) in depth. In this subzone are often found the usual pelagic species as well as others restricted to this zone, such as the akule, ‘opelu and kawakawa. The benthic, or bottom habitat, is the sea floor at depths from 180 to 900 feet (50 to 300 meters) in which the fish fauna is only poorly known (Gosline and Brock 1965:7). The inshore or reef habitat extends from the above surface splash and surge pools to a depth of about 180 feet (50 meters) (Gosline and Brock 1965:5). As noted above, this area is quite limited in extent in the Hawaiian Islands because of the steepness of the underwater base. Only in embayed areas such as Kaneohe Bay on Oahu does the horizontal extent of the zone exceed one-half mile (0.8 kilometers). The largest marine biomass (total living weight) is found in this inshore habitat and it was the habitat most extensively exploited by Hawaiians, as will be shown in Chapter III.” (Newman 1968: 12).

Newman noted the predominance of fishing on the leeward side of Hawaii Island in his statement: “Historical studies also show that most fishing tended to take place along the leeward coastlines although this may have also been due, in part, to the difficulties of fishing

the inshore waters of the windward shores. For example little fishing was described by Ellis (1963) for the windward coastline of Hawaii Island in 1823 although fishing was very important in leeward areas.” (Newman, 1968: 15).

In his journal of 1823 under the entry: “Kawaihae Back North Toward Mahukona by Thurston, William Ellis writes, “The coast was barren; the rocks volcanic; and Mr. Thurston was informed that the inhabitants of the plantations, about seven miles in the interior, were far more numerous than on the shore. (Newman, 1968: 288). Newman notes: “This distance is erroneous for that would place them on the other side of the Kohala Mountains – probably more like 2-3 miles” (Newman, 1968: 250).

In looking at the information for the late eighteenth century, Newman notes that “Careful research through the journals of Cook, Clerke, King, Anderson, Samwell, Burney, Williamson, and Edgar, however, yielded only scant materials on sea exploitation. (Newman, 1968: 52).

Early nineteenth century fishing techniques were described in the diary of Archibald Campbell, who observed fishing by net, hook and line and poisoning during his stay on Oahu during 1809 and 1810. Campbell notes that the hooks were made of pearl or turtle shell and that iron trade fishhooks were coming into general use. “The only type of hook and line fishing mentioned was trolling with the pā type lure for aku, ‘ahi and mahimahi. Campbell noted that the fish lines were made of olona, spun into lines by rolling the fibers between the hand and thigh” (Newman, 1968: 50).

Newman (1968) recounts John Papa II’s description of early nineteenth century fishing in Hawaii. Ii was born in 1800 “...and served in the Kamehameha I household under Liholiho, the son of Kamehameha I. He describes this account:

Kamehameha was often seen fishing with his fishermen in the deep ocean, where the sea was shallow, and where fish-poison plants were used. He took care of the canoe paddlers who went out for aku fish, bringing in supplies from the other islands for them and sent ships to and fro fetching nets, lines, olona fibers and other things (p. 69 – Ii in Newman 1968: 51).

Kamakau, who was born in 1815, and was a native historian about the earlier period of the life of Kamehameha I. He described fishing techniques during this early nineteenth century period as:

There were deep sea nets for fishing (aumaiema), shallow sea nets for fishing (laulele), nets for fishing by diving (‘upena-lu’u), fishing by enticing into the net by means of a stick with a strong odor (lawai’a melomelo), aku trolling with mother-of-pearl hooks (lawai’a-a-bi-aku), ahi trolling with hook and line (bi-ahi), net fishing from flying fish (hanomalolo), trolling for kabala fish with hook and line (bi-kabala), and several other kinds” (p. 176 Kamakau in Newman 1968: 51)

Malo, Ii, and Kamakau “...tend to substantiate one another and depict the use of seine /bag net combinations, bag nets used alone, melomelo bait sticks, fish poisoning, handheld diver’s nets, trolling for aku with the pā lure as well as hook and line fishing for ‘ahi and kahala.” (Newman 1968: 51).

Newman (1968) notes that

Middle nineteenth century sea exploitation has been well and authoritatively described by A.D. Kahaulelio in the Hawaiian-language newspaper, Ka Nupepa Ku`oko`a. These articles have since been translated by Mary Pukui and the translation manuscript is to be found in the Bishop Museum Library (Kahaulelio, 1902)...It will be seen that many of the techniques described by Beckley and Cobb from the late nineteenth century are also described by Kahaulelio for this earlier period (Newman 1968: 42-43).

The techniques described by Kahaulelio included spearing, hand collection, basket traps, nets and hook and line. Spearing, hand collection and basket traps “were described by Kahaulelio in terms quite similar to those of the late nineteenth century authors, making it certain that the same general techniques were in use throughout these two time periods.” (Newman 1968: 43).

In the 17th and 18th centuries, political strife became common in the islands, as ruling chiefs battled for dominance. By 1700 CE, the islands had developed the social structure that would greet Europeans on their arrival, with population centers, royal centers, temple complexes, and intensive dryland and irrigated agriculture (Fornander 1996; Ii 1963; Kamakau 1992; Kolb 1991; Malo 1951; Tomonari-Tuggle 2002).

Political power became increasingly concentrated, culminating in the development of multi-island chiefdoms in the late 1700s. In 1778 Captain James Cook was the first European to arrive in Hawai‘i, followed by European and American traders looking for supplies and trading opportunities. The influx of European and American trade goods, including cannons and other heavy weapons, influenced Hawaiian politics in the end of the 18th century and beginning of the 19th century. By the time of his death in 1819, the legendary Kamehameha I was ruler of all the Hawaiian Islands (Fornander 1996; Kamakau 1992).

Post Contact Historical Overview

American and European missionaries began arriving in 1820, at approximately the same time that the ancient kapu system collapsed. An influx of settlers, traders, and farmers brought about great changes in Hawai‘i’s social structure, economy, and natural environment.

It was in 1839 that the first official recognition of konohiki fishing rights was made by Kamehameha III when he passed “An Act to Regulate Taxes,” which divided up ancient fishing rights giving “one portion of them to the common people, another portion to the landlords (konohiki) , and a portion he reserves for himself” (Laws of 1842, section 8, Chapter III). The konohiki, or overseers of ahupua‘a (land divisions providing complete land and sea provisions for living in them) was given the right to regulate fishing in the waters adjoining his ahupua‘a “from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach” (Murakami in MacKenzie (Ed)

1991: 175). The other grounds outside the coral reefs are to open to all – the Kilohe‘e ground (area where squid was spotted and caught using a hook and line), the Luhe‘e ground (area where squid were too deep to be seen but were caught with cowry shell lures), the Malolo (flying fish) ground, together with the ocean beyond. In addition, the king kept for himself certain species from the fishing grounds seaward of the reefs. (Murakami in MacKenzie (Ed) 1991: 174)

The konohiki, or overseers of ahupua‘a (land divisions providing complete land and sea provisions for living in them) was given the right to regulate fishing in the waters adjoining his ahupua‘a “from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach (Murakami and MacKenzie 1991: 175).

The Great Mahele was a land redistribution system put into place beginning in 1845, redistributing and privatizing land all through the islands. The development of commercial agriculture (ranching, sugar, and pineapple) resulted in waves of new immigrants, including Chinese, Japanese, Portuguese, and Filipinos brought in to work the plantations.

Meller notes that “During the division of lands at the time of the Great Mahele, title to konohiki fisheries normally was not part of awards made by the Land Commission. “The Land Commission did not decide on the question of...fisheries, except as incidentally to its other duties.” (Meller 1984: 8).

In 1851, a major revision of this law was passed “which unequivocally granted all fishing grounds pertaining to any Government land or otherwise belonging to the Government to the people for the free and equal use of all persons” (Kosaki 1954: 2).

In 1859, the Hawaii Legislature passed the Civil Code of 1859, and codified laws pertaining to konohiki fishing rights in sections 387 and 395 (Kosaki 1954: 2). Kosaki notes that

As evolved through the years, the main features of konohiki fishing rights are as follows:

1. Certain areas of the sea, from the reefs and, where there happen to be no reefs, from the distance of one geographical mile seaward to the beach at low watermark, are the private fisheries of the konohikis.

2. Within these private ocean fisheries, fishing is restricted to the konohikis and the ho‘ainas, or tenants of the lands (ahupua‘a) to which the fisheries were originally attached.

3. The konohikis can regulate the fishing within the fisheries by one of the following two methods:

(a) By setting aside or placing a tabu on one specific type of fish for their exclusive use; or

(b) After consultation with tenants, by prohibiting fishing during certain months of the year and, during the fishing season, to exact from each tenant one-third part of all the fishes caught in the fishery.” (Kosaki, 1954: 3-4)

As part of the process started in the Great Mahele, in 1873 and 1878, the Boundary Commission gathered information on the ahupua`a from informants to determine the disposition of the lands.

The coastal region east closest to the Proposed Action site is Malae Point and the area around it. Malae Point is the boundary of two ahupua`a: Kaihooa and Ki`iokalani. To the south of Malae Point are the ahupua`a of Pohakulu and Ahulula. Further to the south is the Pu`u Ulaula region including Kalala (1&2), Makiloa and Pahinahina. To the north of Malae Point is Waiwaiou Bay which includes Puaiki ahupua`a and Puanui ahupua`a. Further to the north is the Keawanui Bay region including Kehena (1&2), Kipi and the Kaupalaoa ahupua`a. For the purposes of this analysis, the six ahupua`a surrounding Malae Point are further analyzed to learn the names of the ahupua`a and places on them.

In the UH DURP 2005 North Kohala Coastal Cultural Resource and Heritage Landscape Study there are two tables which provide information on the names of the ahupua`a, places associated with these ahupua`a. One table is entitled: “Boundary Descriptions Table” and the other is entitled: “Kohala Boundary Claims Data Synthesis Part I – Kohala Iwaho (Outer Kohala)” (UH-DURP 2005). There were three informants that provided this information named Kekuaaea (1878), Pohakuuli (1878) and Kanaha (1873 and 1878). (DURP 2005).

Fig. 2.11 – 1. Information on six ahupua`a in coastal region around Malae Point (UH-DURP)

Ahupua`a name	Meaning	Boundary Description (from informants as noted, referenced in DURP 2005)	Land Ownership (from “List of N. Kohala Ahupua`a” in DURP (2005))
Puanui	Big Flowers	Kanaha (1873) notes areas used for cultivation as well as ancient road systems. This ahupua`a was noted as having ancient fishing rights extending out to sea.	Land Court Award 9971:20 to W. P. Leleiohoku, currently owned by B.P. Bishop Trust, leased to Ka`ike o Ka`aina.
Puaiki	Small Flowers		Returned by L. Kamehameha, returned by aupuni, became government land, the makai parcel deeded to Kahua Ranch in exchange for other mauka lands.
Ki`iokalani	Statues of the Heavens	Kekuaaea states: “thence to Ahulilili, a resting place. The compass was put here to sight to Puulepo; thence makai to Pukoae, a resting place; thence to Malae, a	Land Court Award 8519-B:2 to Fanny Young, ahupua`a acquired by Kahuā Ranch, and makai parcel now owned

		point at the shore; bounded makai by the sea. Ancient fishing rights extending out to sea...” (Vol. B:276 in DURP 2005). Pohakuauli stated at the same time that Kiiokalani was “bounded makai by the sea, where we went fishing; we had to give fish to the Konohiki...” (Vol. B:277 in Boundary Descriptions Table of DURP 2005)	by Ponoholo Ranch.
Kaihooha			Returned by L. Kamehameha and Leleiohoku, Returned by aupuni, became Government Land
Pohakulua	Double Stone		½ returned by E. Kekela, no Land Court Award, ½ returned by E. Kekela, returned by aupuni, became Government Land
Ahulua			Government Land, omitted in the Mahele

Of the six ahupua`a, two (Ki`iokalani and Puanui) had place names noted in Boundary Commission testimonials that were translated and provided in the DURP 2005 report table entitled: “Kohala Boundary Claims Data Synthesis Part I – Kohala Iwaho (Outer Kohala) (UH-DURP 2005). Figure 2-11 – 2 describes place names in the Ki`iokalani ahupua`a and Figure 2-11 – 3 describes place names in the Puanui ahupua`a.

Figure 2.11 – 2 Place names in Ki`iokalani ahupua`a from Boundary Commission testimonials (UH-DURP 2005)

Site name	Description	Informant

Puulepo (“Hill of Dirt”)	Located just above gov’t road to Kawaihae	Kekuaaea, 1878
Anuliili (“A Little Bit Cold”)	A resting place	Kekuaaea, 1878
Puukoae (Hill of the Koae (either a bird or a banana variety))	A resting place	Kekuaaea, 1878
Malae (Serene)	A point on the coast	Kekuaaea, 1878
Kaihooa		Pohakuauili, 1878
Kunohohuiwai	A place to set water calabashes	Pohakuauili, 1878
Ki’iokalani (“Statue of the Heavens”)	A kauhale (traditional housing complex) was noted as having the same name as the ahupua`a	Pohakuauili, 1878
Keeokalani	This place was located on the shoreline, and seems to be the same name of the sand at this site.	Kanaha, 1878
Puuokawa	Place name	Kanaha, 1878
Ahuapaoo	Name of a farm site, or mahina ai	Kanaha, 1878
Keanakaluapuaa	Possibly associated with a site for cooking pigs	Kanaha, 1878
Kealakapala	Place name	Kanaha, 1878
Koaica	A kihipai or smaller land division in an ahupua`a	Kanaha, 1878
Puupuleha	The name of the house site of the informant	Kanaha, 1878

Figure 2.11 – 3 Place names in the Puanui ahupua`a from Boundary Commission testimonials (UH-DURP 2005)

Site name	Description	Informant
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Puanui	Areas used for cultivation as well as ancient road systems. this ahupua`a was noted as having fishing rights that extended out to sea	Kanaha, 1873
Kihelea	Located near a road to Puuhue Hill	Kanaha, 1873
Wawahonu	A point on the shoreline near a landing area	Kanaha, 1873
Pohakupuloa	Place Name	Kanaha, 1873
Luakii	A spring located at the mauka end of this ahupua`a	Kanaha, 1873
Kaihoa	Place Name	Kanaha, 1873
Malohaumia	The cultivation area of the informant	Kekuaia, 1873

Of these six ahupua`a, two of them are noted as having fishing rights that extend out to sea at that time: Ki`iokalani and Puanui. In addition to these two areas, the next closest area of konohiki fishing rights was further north in the ahupua`a of Kehena, which was noted as having ancient fishing rights extending to sea (DURP 2005 “List of ahupua`a in N Kohala”).

As presented in the analyses by Kosaki (1954), Meller (1984) and Maly (2003), through this period of the Great Mahele, the Boundary Commission hearings, and up to the 1893 revolution and Hawaii Organic Act in 1900, konohiki fishing rights went through a process of being formally recognized, and subsequently limited in scope and number.

A revolution in 1893 replaced the monarchy with a provisional government and then a republic, which was annexed to the United States in 1898 as a territory (Dorrance and Morgan 2000; Kuykendall 1968; Tomonari-Tuggle 2002).

The 1900 Hawaii Organic Act contained specific sections that repealed most exclusive fishing rights and made fishing open to all citizens. If anyone claimed exclusive fishing rights, these must be registered.

In 1904, the U.S. Supreme Court reaffirmed the intent of Congress in this regard when it stated in *re* Fukunaga, (16 Haw. 306, 1904) that, “The intent of Congress is clear to destroy, so far as it is in its power to do so, all private rights of fishery and to throw open the fisheries to the people.”

At the time of the annexation of Hawaii, it could not be accurately determined how many private fisheries existed in the Territory (Bishop v. Mahiko, 35 Haw. 608 (1940) in Kosaki 1954: 9). Of the estimated 300 to 400 private fisheries, about 100 were registered (Kosaki 1954: 9).

Despite the fact that the 1873 and 1878 Boundary Review Commission records noted konohiki fishing rights for Kiʻiokalani ahupuaʻa, Puanui ahupuaʻa, and Kehena ahupuaʻa, a review of copies of records compiled by the office of the Territorial Surveyor of all registered fisheries provided in Kosaki (1954) shows that no exclusive fisheries were registered in this area of North Kohala. If the fishery was not registered, then, according to Bishop v. Mahiko, the right became invalid. (Kosaki 1954). Therefore, it is assumed that there are no konohiki fishing rights in this area of ocean adjacent to the Proposed Action site.

It was in the late 1880s that ranching started as a major land use in this region surrounding Malae Point and the Puʻu Ulaula area. A number of ranchers began to work the lands including Holmes, Burchardt, MaGuire, Austin and Frank Woods. (Schweitzer 2003, pp. 197-199)

The development of ranching as a major land use in the region was advanced in 1928 with the establishment of Kahuā Ranch by Atherton and Monty Richards and Ronald von Holt, which included about 12,000 acres of land. (Schweitzer 2003). This included fee simple and leased land under ranch management. Among these leased lands is the Puʻu Ulaula region known as the Pahinahina lease, which has been leased by Kahuā for pasture purposes for generations. This lease extends from Kaihooa ahupuaʻa in the north to Pahinahina ahupuaʻa in the south. Kahuā Ranch acquired Kiʻiokalani ahupuaʻa and used it as pasture, and transferred title of the makai parcel to Ponoholo Ranch. Monty Richards has been with Kahuā Ranch for fifty-five years. For thirty years, he was President and General Manager. Monty is the nephew of Atherton Richards, cofounder of Kahuā Ranch. In the 1980s, there was an amicable separation and part of Kahuā Ranch, including this area, was split off to form Ponoholo Ranch, an 11,000 acre ranching operation currently run by Pono Von Holt, the son of Ronald Von Holt, co-founder of Kahuā Ranch. In 2002, Monty passed the reins of Kahuā Ranch to his son, Tim, who is now the President and General Manager.

Because of this historical association that Monty Richards and Pono Von Holt have with the Pahinahina lease, and Kiʻiokalani, local kupuna, William Akau recognized that Monty Richards and Pono Von Holt would be the modern-day caretakers or konohiki of the area of ocean where the proposed lease site is located. Akau emphasized that Kahuā Ranch and Ponoholo Ranch own or lease all the ahupuaʻa in that area and have ranched the land there for generations. He said that the Hoʻopai family should be consulted since they have been the Hawaiian paniolo family using the area for generations. He also said to talk with some longtime fishermen in the area, who have been targeting ʻōpelu, mahi, ono, and bottomfish.

It's important to recognize that according to records of all registered fisheries in the office of the Territorial Surveyor, none were located off Kiʻiokalani ahupuaʻa, or other ahupuaʻa in the Puʻu Ulaula region of North Kohala. So, there are no legal konohiki rights or registered fisheries in the area. Rather, Richards and Von Holt are recognized as konohiki in the sense of being the stewards of the land in the area.

To the North of Malae Point in the small bay of Waiwaionū, bounded by Kiʻiokalani ahupuaʻa and Puaiki, the ahupuaʻa adjacent to Kiʻiokalani to the north. Puaiki ahupuaʻa was transferred by King Kamehameha III in “An Act Relating to the Crown, Government, and Fort Lands, in 1848” to become the lands of the Hawaiian Government. After the overthrow of the Hawaiian Kingdom in 1893, the lands became part of the Territory of Hawaii. And, after statehood, the lands became part of the state of Hawaii. The ahupuaʻa mauka of Akoni Pule Highway is leased to Parker Ranch under Revocable permit S-3219. The parcel of land in the Puaiki ahupuaʻa that is makai of Akoni Pule Highway was transferred in 1967 by the State of Hawaiʻi to Kahuā Ranch in exchange for the State obtaining other Kahuā Ranch land for highway purposes under Grant S-14,716 to Kahuā Ranch, Ltd. The mauka lands of Puaiki ahupuaʻa and Puanui ahupuaʻa were leased by Parker Ranch and used as pasture.

Adjacent to the north of Puaiki is the Puanui ahupuaʻa, where there was a larger settlement as indicated by the substantial historic remains described by Bonk (1968) and Clark (1968). The land was awarded to William Pitt Leleiohoku through Royal Patent 8161, Land Commission Award 9971, Apana 20. Leleiohoku, a Prince of the Kingdom of Hawaii, in turn willed the land to his first cousin, Princess Bernice Pauʻahi Bishop, and the land is now part of the Kamehameha Schools/Bishop Estate land holdings. The current lessee is Kaʻike o Kaʻaina, a nonprofit educational and cultural organization, whose President is Michael Hanohano. This is a nonprofit native Hawaiian group of kūpuna dedicated to education and cultural programs for keiki. Mr. Hanohano is also the great grand-nephew of W.P. Leleiohoku.

In summary, the dominant use of the shoreline area around Malae Point and the Puʻu Ulaula area has been associated with ranching, and recreational and subsistence use by the paniolo families from Kahuā Ranch since the Ranch started in 1928 (Hoʻopai, 2008).

Cultural Resource Summary Consultations and Reports

A cultural impact assessment study was 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 included substantial research of historical documents, which provided the basis for the previous sections describing the history of the site and surrounding coastal region. The Cultural Impact Assessment also included interviews with selected individuals who are familiar with the cultural practices and features associated with the project area, then arranging for interviews with each individual. The interviews included 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 included 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.

The following individuals were interviewed to gather information about the region adjacent to the Proposed Action site:

1. William Akau, was first contacted as the former harbor master of Kawaihae, and recognized as the Native Hawaiian kupuna and konohiki of anything to do with the ocean in the Kawaihae area. Mr. Akau provided an oral history interview. He was born in Kawaihae, and his father was born in Kawaihae uka, just mauka of the village.
2. Monty Richards, owner of Kahuā Ranch, was identified by Mr. Akau as the konohiki of this area of ocean since Kahua owned and leased all the land in this region for generations. Monty, who is the nephew of Atherton Richards, who co-founded the Kahuā Ranch in 1928.
3. Pono Von Holt, owner of Ponoholo Ranch is the son of Ronald Von Holt, co-founder of Kahuā Ranch in 1928 with Atherton Richards. Pono is also recognized as the konohiki of the region, especially since Pono Holo Ranch owns Ki'ioikalani makai parcel.
4. The Ho'opai family members are Native Hawaiian cultural practitioners at Ki'ioikalani and the surrounding area since 1928 taking care of the land, ranching, camping, fishing, gathering, and perpetuating native Hawaiian history, cultural values and traditions to the next generations. Kimo Ho'opai is recognized as the last of the old-time paniolo in this area. He was born at Kahuā, where his father started working in 1938.
5. Kimo's wife, Leina'ala also was born at Kahuā, where her father started working in 1928 when the Ranch was formed.
6. Bernard Ho'opai is their son, who also works for Kahuā. With Bernard's grandchildren carrying on the paniolo tradition, the Ho'opai family is a fifth generation Native Hawaiian paniolo family working for Kahuā Ranch.
7. Eddie "Lala" La`au is recognized as the kupuna 'ōpelu fisherman in the Kawaihae area whose father and grandfather also fished these waters before him. He is a Native Hawaiian cultural practitioner and provided an oral history interview.
8. Kwanji Fukuyama is recognized as a long time bottom fisherman. When in season, he targets onaga, opakapaka, ehū and the other four of the seven bottom fish species. Kwanji also trolls for ono and mahimahi.

Robert Cambra, Sr. is a long time 'ōpelu fisherman, who had previously fished for bottomfish provided a consultation. His father-in-law was Takeo Yamasaki, who started fishing about 50 years ago and fished actively until about 20 years ago. Robert fished with his father-in-law for many years. He fished for 'ōpelu, weke, uku, trolled for mahi and ono, and sometimes bottom fish..

Another individual that was consulted was Michael Hanohano, who is the grandnephew of William Pitt Leleiohoku, the Land Commission Awardee for Puanui ahupua'a, just north of Malae Point. He is a Native Hawaiian cultural practitioner who is President of the nonprofit group, Kahiki o Ka Aina, who is the lessee of Puanui from the landowner Kamehameha Schools - Bishop Estate.

The Alternative 2 Site that was analyzed for this project was also included in a supplementary study in the attached Cultural Impact Assessment that considered the potential cultural impact of that site. To understand the cultural resources and potential impacts on these cultural resources in that Kona site, the research relied on previously conducted interviews of kupuna in Kona. The oral history interviews were done by Kepa Maly and included: George Kahananui, Lily Ha`anio-Kong, Peter Park, Robert Punihaole and Valentine Ako. These oral history transcripts were collected by Kepa Maly in *Ka Hana Lawai`a A Me Na Ko`a O Na Kai`Ewalu, A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands*, (The Nature Conservancy, 2003). In addition the notes from meetings of Kona Blue Water Farms with Kekaha kūpuna regarding the concept of the proposed open ocean fish farm, which were used to obtain input on traditional perspectives and cultural issues. (KBWF 2002).

The various historical research documents used in the course of this study are listed in the bibliography included with this report. Additional information is available with the Cultural Impact Assessment appended to this report.

Prehistoric and Historical Resources of the Proposed Action site, adjacent ocean area, and adjacent coastal area

Document research and oral history interviews have not provided any oral tradition, legend, or cultural activity associated with the preferred ocean lease site in Kohala off Malae Point in particular. There are no resources within the Region of Influence (ROI) that are listed on the National Register of Historic Places (NRHP) (NPS 2007).

The site is far offshore and interviewees have noted that it is not used for trolling, net fishing, `ōpelu fishing, bottom fishing, or other cultural practice. While no fishing usually takes place in the proposed action site, fishermen from the bottomfish fishery located about one mile away, have expressed the concern about potential negative impacts on the fishery from waste and excess feed reaching the bottom environment. Other fishermen have also expressed concern about the platforms causing an increase in sharks in the area, that would affect their fishery.

Interviews with kupuna fishermen noted, and bathymetric charts confirm, that there is no underwater feature in the area of the ocean lease site that would serve to attract fish (Akau 2008, La`au 2008, Cambra 2008, Fukuyama 2008). They confirmed that in this part of the ocean, the cultural resources and practices of trolling, `ōpelu fishing, bottom fishing, and shoreline harvesting were all concentrated in coastal waters within 1 to 2 miles from the shoreline. (Akau 2008, La`au 2008, Ho`opai 2008, Richards 2008). Cultural activities today are a modern reflection of the same cultural activities of ancient times, including fishing in the coastal waters, and from the shoreline. `Ōpelu koa were well known to the master fishermen, who tended these ko`a to prepare the fish for harvest during its proper season. Interviewees noted that there were `ōpelu ko`a fishing grounds all along this part of the coast, within ½ mile from shore at locations close to Waiakailio Bay, all along the Red Hill (Pu`u Ulaula) area to Black Point (Malae Point), and Waiwaionū Bay at Puanui, and beyond to Keaweula Bay all the way to Mahukona (Akau 2008 and La`au 2008).

In addition to the ‘ōpelu, fishermen would also troll along the 30 – 40 fathom contour for ono, or other target species (Akau 2008, La‘au 2008, Ho‘opai 2008, Richards 2008). Fishermen would also fish for aku, during its proper season. And fishermen would also target onaga and other bottom fish (La‘au 2008, Cambra 2008, Fukuyama 2008). These ‘ōpelu ko‘a are very important natural and cultural resources and could be considered as an ATI. They are located over two miles away from the proposed ocean lease site. Bottom fishing extended out to about the 150-160 fathoms, or about one mile from the Proposed Action site (Fukuyama 2008).

Even though the 1873 and 1878 Boundary Review Commission records noted konohiki fishing rights for Ki‘iokalani ahupua‘a, Puanui ahupua‘a, and Kehena ahupua‘a, a review of copies of records compiled by the office of the Territorial Surveyor of all registered fisheries provided in Kosaki (1954) shows that no exclusive fisheries were registered in this area of North Kohala. If the fishery was not registered, then, according to *Bishop. v. Mahiko*, the right became invalid. (Kosaki 1954). Therefore, it is assumed that there are no konohiki fishing rights in this area of ocean adjacent to the Proposed Action site.

To provide some cultural context for the preferred ocean lease site offshore Malae Point, this analysis looked to the land closest and due west of the ocean lease site for information. There are numerous remains of historic dwelling sites found along the shoreline at several sites dispersed along the Pu‘u Ulaula region as described above and detailed in Bonk (1968). Two major settlement areas were at Waiakailio Bay and Waiwaionū Bay. To the north was another settlement at Keawanui Bay and a large settlement at Lapakahi. Information on the six ahupua‘a in the Malae Point area are presented above in Figure 2.11-1.

In the 2005 study completed by UH Department of Urban and Regional Planning (UH-DURP) entitled, *North Kohala Coastal Cultural Resource and Heritage Landscape Study*, reviewed all the archeological surveys of leeward Kohala coastal area and provided a list of place names associated with two ahupua‘a of Ki‘iokalani and Puanui (see above Figure 2.11-2 and 2.11-3). There were no designated or recommended protective buffer zones for historic sites recommended at Malae Point or in the ocean lease site area.

Along the shoreline is a section of the Ala Kahakai National Historical Trail, that connects ancient and modern trails along the shoreline and mauka-makai. The Ala Kahakai National Historical Trail recognizes the significance of the coastal trail and its corridor as a cultural resource that shaped the Hawaiian culture. While the Pu‘u Ulaula area of North Kohala is included in the designated Trail system, it is outside the priority area for implementing the 15 year planning period for all alternatives in their recent Draft Comprehensive Management Plan and Environmental Impact Statement (AKNHT- NPS 2007, p. 5) Maps in this document showing the North Kohala region of the Trail note that the land in the Pu‘u Ulaula area is government owned land, except for Ki‘iokalani. The map names the area “Kahuā Ranch, Ponoholo Ranch (Malae Point), and indicates there was a possible lateral trail along this coastline (AKNHT - NPS, 2007, p. 99). There is a trail that goes mauka-makai in the Ki‘iokalani ahupua‘a, and a partial coastal trail along the shoreline (Stevens 1994 in UH-DURP 2005)

The shoreline is used for camping, fishing, gathering for recreational, subsistence, and cultural purposes (Ho`opai 2008), (Hanohano, personal communication). The coastal waters are used for `opelu fishing, and trolling for mahi and ono, and bottomfishing for onaga and other bottomfish. A primary cultural value that was stated by the Ho`opai `ohana and shared by Monty Richards, Pono Von Holt, Robert Cambra, Kwanji Fukuyama, William Akau and Lala La`au is to take care of nature and it'll take care of you. Bernard Ho`opai said, "You have to take care of nature and it'll take care of you. You need to give back. The more you give back, the more it'll take care of you." (Ho`opai 2008). Similar statements can be seen in Richards (2008), Cambra (2008), Fukuyama (2008), Akau (2008) and La`au (2008).

Potential for Unknown Resources in Proposed Action site and adjacent shore

Based on historical document research, oral history interviews, and observational surveys, there is no documentation or memory of existing or possible cultural resources in the ROI. Nonetheless, it is possible, though highly unlikely, that future surveys and research may reveal their presence, at which point further studies and documentation may be undertaken.

CULTURAL RESOURCES ANALYSIS OF ALTERNATIVE 2 SITE OFF KEAHOLE POINT, KONA

Prehistoric and Historical Resources of the Alternative 2 site and adjacent shore

The coastal lands on the shore closest to the alternative site are the lands of Kalaoa and `O`oma, which are both part of the broader coastal region called Kekaha. In prehistoric and historic times, there were numerous fishing communities that lived along the coast, including one at Ho`ona (now a Historic Reserve) at Kalaoa near Keahole Point, Wawaloli and `O`oma to the south. Additional habitation sites are found continuing south through Kohanaiki, Kaloko, Honokohau, all the way to Kailua. The Journal of William Ellis in 1823 included a description of Kailua, the larger settlement several miles south of the Keahole area in the following passage. While it is not specifically the same place, it does give one an indication of how the coast in this area was populated.

Kairua, though healthy and populous, is destitute of fresh water, except what is found in pools, or small streams, in the mountains, four or five miles from the shore. (p. 29) The houses, which are neat are generally built on the sea-shore, shaded with cocoa-nut and kou trees, which greatly enliven the scene. The environment were cultivated to a considerable extent; small gardens were seen among the barren rocks on which the houses are built, wherever soil could be found sufficient to nourish the seet potato, the watermelon, or even a few plants of tobacco, and in many places these seemed to be growing literally in the fragments of lava, collected in small heaps around their roots.

The next morning, Messrs. Thurston, Goodrich and Harwood walked toward the mountains, to visit the high and cultivated parts of the district. After traveling over the lava for about a mile, the hollows in the rocks began to be filled with a light brown soil:

and about half a mile further, the surface was entirely covered with a rich mould, formed by decayed vegetable matter and decomposed lava. The path now lay through a beautiful part of the country, quite a garden compared with that through which they had passed on first leaving the town. It was generally divided into small fields, about fifteen rods square, fenced with low stone walls, built with fragments of lava gathered from the surface of the enclosures. Those fields were planted with banana, sweet potatoes, mountain taro, paper mulberry plants, melons, and sugar-cane, which flourished luxuriantly in every direction... (Ellis, 1963)

In Kona, the stories from fishing activity identified nearshore and offshore fisheries, including stories about ‘ōpelu fishing, collection of opae ula for fishing (Ako, Valentin, et al, p. 52) and travel and trade between the makai fishermen and the mauka farmers within an ahupua‘a or its neighbors. George Kinoulu Kahananui, Sr. described ‘ōpelu fishing in the North Kona area, shark fishing, nearshore fishing (Kahananui, George, p. 226- 238, etc.), especially the area between ‘O‘oma and Kaupulehu, which includes Keahole, the lands of Kalaoa and Kekaha.

Walter Paulo described ‘ōpelu fishing and the maintenance of the ‘ōpelu ko‘a. He notes in his interview that the opelu ko`a is “...maybe hundred to hundred fifty feet...I would say about a quarter mile offshore.” (Paulo, pp. 291-292). Paulo describes the effect of Fish Aggregation buoys on opelu ko`a “You going to attract if you have a buoy there and you attach a netting like on it, it’s to attract the small fishes. You are going to find `ōpelu over there.” But he also notes he is in favor of fish aggregating devices when asked what he thought of them: “It’s very good provided you can find it. But they do attract, why they put it in that depth it attracts ono, it attracts mahimahi.” (Paulo, p. 293). He also described various bottom fishing and the introduction of long line fishing in Kona. He described aku and ‘ahi fisheries in the North Kona area and also discussed trolling for aku a mile or less offshore (p. 307) Paulo also talks of fishing for aku at the “hundred fathom ledge or fifty, this aku comes up.” (Paulo, p..319). Kepa Maly notes in this interview

It is very interesting, in the old Hawaiian laws that you see in the traditions, and the stories of traveling great distances to go out and fish. The large canoes, mostly ali`i kinds of things. By 1839 when you see the laws that Kamehameha III enacted, and as they carried through in subsequent laws. They always reference going out as far as the malolo fishery and into the high seas beyond. You’ll find just that wording, they talk about the ‘apapa fishery, the kilobe‘e, malolo, and the deep sea, the high seas. We know that there is a tradition of the kupuna making great use of the resources near and far (Paulo, p. 319).

Paulo also reiterates a common Hawaiian cultural value: “You have to malama this aina. Because it takes care of you. And it is the same with the ocean and the ko`a i`a. Take care of them because they take care of you.” (Paulo, p. 327). Peter Park discusses the fisheries of the area near Keahole (Kaloko - `Ooma – Kalaoa area) and discussed limu collecting, nearshore fisheries, trade of fishermen with families of the uplands. (Park, pp. 373 – 390)

Valentine Ako speaks of fishing in Kona to depths of more than 1,000 feet for “maguro,” which he describes as “that’s the one goes up to fifteen hundred pounds.” (Ako, p. 422). He describes opelu fishing close to shore, and marked the 41 fathom contour in an interview with Kepa Maly (Ako, p. 437). Ako discussed aku fishing far from shore. He notes they would go out twenty miles to find the aku to catch, (Ako, p. 425) Ako also spoke specifically of Keahole and the currents faced in the waters by the point. (Ako, p. 425-426). He also spoke of fishing for `opakapaka, ehu and other species to depths of more than 900 feet. (Ako, p. 428) Ako spoke of going out to “The Keahole lighthouse, about a mile outside of Keahole lighthouse...These were our fishing grounds and beyond that. It all depends on the current..” (Ako, p. 430). Ako also criticized the Fish Aggregating Devices, and recommended getting rid of them. (Ako, p. 441-442). Ako discusses akule fishing in the nearshore area (Ako, p. 450-453) and fishing for other species in the nearshore area (Ako, pp. 457-469)

Robert Punihaoale spoke of ‘ōpelu ko‘a being two or three hundred feet from shore (Punihaoale, p. 529). He also spoke of going fishing far from the sight of land (Punihaoale, p. 532). But, he also spoke of fishing in his youth being three or four miles offshore (Punihaoale, p. 533). Punihaoale spoke of the treacherous current at Keahole (Punihaoale, p. 533). He described the shoreline fishing as

It’s for the ohana, that’s food for the family. But when we go outside moana, it’s ‘ōpelu, aku, ulaula, opakapaa, all this water...Kukaula if you’re going for ‘ahi you go hundred twenty, hundred forty for ‘ahi. Fathoms....Hundred eighty fathoms. If you go for ‘ula‘ula, eighty fathoms. You go for ‘ahi holo, not the kind ‘ahi ‘ele‘ele is way down, hundred forty, hundred thirty fathoms. The ‘ahi holoholo, holo i waena, is forty fathoms. You go kaka drop forty fathoms. You start from thirty nothing, then you hit forty, you mark your line. As soon as the fish come up you buki up, put in the boat, you bait ‘em, put your kaka, let go the pobaku. You not going get a pobaku, you going get the ahi. (Punihaoale, pp. 534-535).

Punihaoale talked about trolling for aku (Punihaoale, p. 535) in the deeper waters, and fishing for luhe`e and a variety of finfish in the nearshore waters (Punihaoale, p. 570).

Along the shoreline of Kekaha is a section of the Ala Kahakai National Historical Trail, that connects ancient and modern trails along the shoreline and mauka makai. The National Trail recognizes the significance of the coastal trail as a cultural resource that shaped the Hawaiian culture. The Keahole Point area is designated as an area with “High Potential Cultural Sites and Complexes” and is described as follows: “Keahole Point to Kaloko Ahupua‘a includes small clusters of permanent houses, associated graves, small heiau, and temporary shelters including Wawaloli - ‘O‘oma habitation cluster that exemplifies the ancient and historic periods (AKNHT-NPS 2007, p. 23).

Based on the analysis of these oral histories, it appears that most of the fishing in the Kona area took place nearshore, within a mile from shore and mostly within ½ mile and along the shoreline. In addition, there were recognized fisheries in the deep water going to over 1000’ for ahi, 900’ for opakapaka and ehu (Ako p. 428). One interviewee mentioned fishing in his

youth at three or four miles offshore. (Punihaole, p. 533) This is reflected in modern fishing practices, with vessel survey observations and survey reports fishermen saying that they fish all over the Keahole Point area including out to deep water trolling in the area offshore North Kona at the 1000 fathom contour (Rizutto 2008), which is located about three miles offshore.

Interviewees and cultural historians cited in the Kona Blue Water Farm Environmental Assessment noted that there were no ‘ōpelu ko‘a at the area of the Kona Blue Water Farm lease site (KBWF 2003, p. 68). Using this same information, as well as the data from Ako, Paulo, and others, it can be concluded that the closest ‘ōpelu ko‘a would be near the shoreline, located over two miles from the lease site. This distance, as well as the depth of the waters in the area of the Alternative Lease site offshore Keahole Point would result in very limited potential to affect the behavior of nearshore fisheries, like opelu. Nonetheless, Walter Paulo was clear that even the FADs caused opelu to gather away from the ko‘a (Paulo, p. 293) . Therefore an evaluation of this potential impact should analyze the data from the Cates International, Inc. moi farm off Oahu. The site is about 2 miles offshore, but in shallower waters.

Potential for Unknown Resources in the Alternative 2 site and adjacent shore

Due to the lack of documentation of existing or possible cultural resources in the ROI of the Alternative 2 site, it is possible that future surveys and research may reveal their presence, at which point further studies and documentation may be undertaken.

2.11.2 Environmental Consequences

Impact Assessment Methodology

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

Maps and other documents were examined to determine the locations of the project APEs. Historical and current maps and photographs, cultural resources reports, and archival records were reviewed to identify cultural resources in the APEs. Federal, state, and local inventories of historic (i.e., significant) places, including the NRHP, were reviewed for

information related to prehistoric and historical (pre- and post-Contact) resources considered NRHP-eligible.

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 TCP as defined under Section 106 of the NHPA; or
- A violation of the provisions of AIRFA, ARPA, or NAGPRA.

Public concerns are also considered as part of 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.

Summary of Impacts

Table 2.12-1 summarizes impacts to cultural resources.

**Table 2.12-1
Summary of Potential Cultural Resource Impacts**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action
Historic buildings	N/A	N/A	○	N/A
Archaeological resources	N/A	N/A	○	N/A
TCPs/ATIs	⊙/+	⊙/+	⊙	○

In cases when there would be beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

⊗ = Significant impact	+ = Beneficial impact
⊙ = Significant but mitigable to less than significant impact	N/A = Not applicable
⊙ = Less than significant impact	
○ = No impact	

Proposed Action – Malae Point

Less Than Significant Impacts

TCPs / ATIs: This section presents an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the Proposed Action to isolate cultural resources or practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

No prehistoric or historic cultural resources have been identified in the Proposed Action ocean lease site as eligible or listed as a nomination to the National Register of Historic Places (NRHP). Document research and oral history interviews have not provided any oral tradition, legend, or cultural activity associated with the preferred Kohala ocean lease site in particular. The site is far offshore and interviewees have noted that it is not used specifically for trolling, net fishing, bottom fishing, or other cultural practice (Cambra 2008, Fukuyama 2008, La'au 2008). The area may be used by fishermen trolling from the nearshore ono lane to offshore fishing grounds. There are no historical documents of any official registered konohiki fishing rights in the area. Interviews with kūpuna fishermen noted, and bathymetric charts confirm, that there is no underwater feature in the area of the ocean lease site that would serve to attract fish (La'au 2008, Akau 2008).

In the ocean area adjacent to the proposed ocean lease site, cultural activities today are a modern reflection of the same cultural activities of ancient times, including fishing in the coastal waters, and from the shoreline adjacent to the Proposed Action site. ‘Ōpelu ko‘a were well known to the master fishermen, who tended these ko‘a to prepare the fish for harvest during its proper season. Interviewees noted that there were ‘ōpelu ko‘a fishing grounds all along this part of the coast including Waiakailio Bay, Red Hill (Pu‘u Ulaula) and Black Point (Malae Point).

These ‘ōpelu ko‘a are very important natural and cultural resources and could be considered as an ATI. The ko‘a are located over two miles away from the proposed ocean lease site. Two ‘ōpelu fishermen said they did not expect there to be any affect of the proposed aquaculture operation on the ‘ōpelu ko‘a (La‘au 2008 and Cambra 2008). Other fishermen thought that there might be some affect on ‘ōpelu migration patterns (Fukuyama 2008).

Interviewees with master fishermen in the area noted that there were no ‘ōpelu ko‘a at the proposed ocean lease site, but there were ko‘a about two miles from the site, located within ½ mile from the shoreline along the Pu‘u Ulaula area. Two fishermen expressed a concern that the FADs caused ‘ōpelu to gather away from the ko‘a (Paulo, in Maly 2003: 293 and Fukuyama 2008). However, others felt that the distance from shore, as well as the depth of the waters in the area of the proposed ocean lease site would result in less potential to cause anything other than temporary effects on the behavior of nearshore fisheries, like ‘ōpelu (La‘au 2008 and Cambra 2008).

This concern was evaluated by analyzing the data from the closest comparable in Hawai‘i, the Cates International, Inc. moi farm off Oahu. The farm site is about 2 miles offshore, but in shallower waters than the proposed ocean lease site off Kohala. Fishermen on Oahu originally expressed opposition to the establishment of the fish farm; now however, they are reportedly very supportive of its presence (KBWF 2003). The ‘ōpelu fishermen, particular, have reacted positively to the farm’s presence, because of the benefits that it has brought in terms of increased catches and regularity of catches. Evidence from the `Ewa Beach fish platform is that ‘ōpelu may be attracted to the platform for some periods, but that the schools still do move up and down the coast (Cates 2003). While it is unknown whether there is any change in the overall abundance of ‘ōpelu, or rather only in distribution, the platform will probably not exclude ‘ōpelu from the ‘ōpelu ko‘a, located over two miles away from the platforms.

In addition to the ‘ōpelu, fishermen troll for mahimahi and ono, and target bottom fish in the fishing grounds in an area limited to the coastal waters between Puako and Mahukona (Cambra 2008, and Fukuyama 2008). Fishermen would troll along the 30 – 40 fathom contour for ono, mahimahi or other target species, which places the trolling lanes over two miles from the proposed ocean lease site. Bottom fishing for onaga in the area of the ocean lease site extends out to 150 fathoms, which places the closest bottom fishing area about one mile from the proposed ocean lease site (Fukuyama 2008).

Bottom-fishing season opened in November 2008. During bottom fishing season, an increased number of boats bottom-fishing is expected out to 140-150 fathoms (Fukuyama 2008). When these fishermen are not bottom-fishing, they may be trolling for ono and mahimahi along the 30-40 fathom line parallel to shore. With all these changes one fishermen summarized the situation saying, “the fishing is hard - there are plenty fishermen now, more fishermen than fish - the area is kinda almost wiped out” (Fukuyama 2008)

Among the interviewees, there was agreement on the location of cultural resources, such as ‘ōpelu ko‘a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and ‘ōpelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from nearshore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘ōpelu, but that it would not have a permanent affect on the ‘ōpelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono.

However, other interviewees warned of a potential negative impact on bottomfishing (Cambra 2008, and Fukuyama 2008). There was concern that the proposed aquaculture operation would interrupt the migratory patterns of bottom fish, as well as mahi and ono (Fukuyama 2008). This concern was based in part on the assumption that some food will escape the cages and attract fish.

Fukuyama warned that the Oceanspheres would attract the bottomfish away from their usual grounds because of the “smell and bits of food” that would drift to the bottom. He predicted there would be more sharks in the area, which would mean more shark predation on bottom fish and, in his words, “It will be the end of bottom fishing in this area” (Fukuyama 2008).

The issue relating to any “smell” and “bits of food” reaching the bottom environment are issues evaluated in the DEIS section 2.4 on water quality. To mitigate this potential impact, the analysis presented conclusions that no waste or excess feed will make it to the bottom environment, therefore it should not attract bottomfish to the site. This will help mitigate any potential negative impact its operations may have on bottomfishing in the area.

At the same time this concern was expressed, it was also expressed that no one was really sure if it was going to have a positive or negative impact until the aquaculture operation is established. Everyone agreed that there would have to be some monitoring to see if it’s having an impact or not, and continuing dialog with the fishing community.

There was also concern that the proposed aquaculture farm might attract more sharks to the area with the increase in the number of fish around the cages (Akau 2008, Fukuyama 2008, Cambra 2008). Bottom fishermen expressed concern about this increase in sharks and its negative effect on their fishery. A specific concern was that more sharks will eat more bottomfish, as well as steal the catch off the fishing lines (Fukuyama 2008). To Hawaiians, the shark is a sacred animal, and is considered a member of their ohana.

As noted in the section 2.5 on Biological Resources, shark management is an important issue addressed through a management plan as described. The shark management plan for the aquaculture farm should only use measures to keep the sharks away from working divers that are respectful to the animal within the cultural context.

The presence of the open ocean aquaculture platforms would likely reduce access to areas that fishermen would otherwise have had open access to in the past.

As noted in the section 2.5 on Biological Resources, fishing would also be allowed around the Oceanspheres, just not above them or below them. Boaters are asked to keep 100' from the navigation light on the surface buoy above each Oceansphere. This is a mitigation measure to provide direct benefits to local fishermen through the potential for increased catches around the aquaculture operation.

As discussed above, to determine how the proposed activity might affect the traditional cultural values and practices associated with the adjacent land area, twelve ahupua'a in the area were researched in the area locally known as Pu'u ulaula (Pahinahina to Kaihooa) and Black Point (Malae Point) (Ki'ioikalani, Puaiki and Puanui), including identifying and contacting all the known and identified cultural practitioners and kupuna, local landowners or long-term lessees, the recognized konohiki of the area and the native Hawaiian families culturally attached to the land.

For the interviewees who camped and shorefished along the shoreline adjacent to the proposed site, they were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews, each of them said it wouldn't affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the viewshed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho'opai 2008, Hanohano 2008).

A primary cultural value that was stated by the Ho'opai 'ohana and shared by other interviewees is: "You have to take care of nature and it'll take care of you. You need to give back. The more you give back, the more it'll take care of you." (Ho'opai 2008). Bernard Ho'opai encouraged the aquaculture farm to give back to the environment and community.

Cultural practitioners and kama'aina with multi-generational connections to the land on the adjacent shoreline also noted no positive or negative impact of the proposed action on their activities (Ho'opai 2008, Hanohano 2008, Akau 2008, Von Holt 2008, Richards 2008).

Interviewees also noted that there may be some positive impact of the proposed project as a modern example of stewardship of the ocean showing how technology is helping provide fish from the sea, now that the fishing stocks have been depleted (Ho'opai 2008, Von Holt 2008, Richards 2008).

Even though this was not expressed by the interviewees, other Native Hawaiian individuals and groups could perceive that the presence of this industry, the Oceanspheres, the increased level of activity, the navigation lights and buoys may contribute to or diminish the connection with their ancestors and disrupt the balance of Native Hawaiian areas of traditional importance.

Based on an analysis of issues, potential impacts and mitigation measures, it is concluded that there would be no significant impacts to cultural resources, practices, or beliefs in the proposed ocean lease area off Malae Point, or in the surrounding ocean in the Kohala area.

No Impacts

Historical Buildings and Archaeological Resources. There are no historical buildings or documented archeological resources within the ROI.

The exclusive control over the waters (and the fish) inside the net platforms is consistent with traditional and cultural practices that identified fish traps or lobster traps - and the animals therein - as the private property of the trap owner. The same principles would apply here.

Beneficial Impacts

The presence of the platforms may result in a greater concentration of fish aggregating nearby the Proposed Action site, which would have the potential beneficial result of increasing catches for fishermen in the area. The company has announced it will allow fishermen to fish adjacent to the Oceanspheres, thereby allowing them to catch the fish that would potentially aggregate around the Oceanspheres.

Interviewees noted that there may be some beneficial impact from the proposed action if it serves as a Fish Aggregating Device to attract fish around the farm's platforms (Akau 2008, La'au 2008), while other fishermen disagreed and felt that it was not beneficial for the platforms to act as FADs (Fukuyama 2008).

Cultural practitioners and kama'aina with multi-generational connections to the land on the adjacent shoreline noted that there was no foreseeable positive or negative impact of the proposed action on their activities (Ho'opai 2008, Hanohano 2008, Akau 2008, Von Holt 2008, Richards 2008).

Interviewees also noted that there may be some positive impact of the proposed project as a modern example of stewardship of the ocean showing how technology is helping provide fish from the sea, now that the fishing stocks have been depleted (Ho'opai 2008, Von Holt 2008, Richards 2008).

Some interviewees asked if the company could consider giving back to the community even more by releasing some fish into the wild for fishermen to catch.

Alternative 2 – Keāhole Point

Among the alternative sites evaluated, the one evaluated in greatest detail for this project is in Kona, located 2.6 nautical miles offshore Keahole Point, North Kona. In Kona, the cultural landscape is different and unique from the Kohala site in regards to the ocean area and the lands adjacent to the alternative site, including the area around Keahole Point, North Kona. In the ocean at the alternative site in Kona, there are also no resources within the ROI that are listed in the NRHP (NPS 2007). The proposed lease area is too deep for free-diving or any significant SCUBA diving activity. There are no significant benthic plant or animal

populations, and there are virtually no benthic or pelagic fishing activities in this depth range. Kona crabs and nabeta are the only benthic resources that occur on sand bottom at this depth, but informants suggest that the currents are too strong for any significant fishing effort this close to Keāhole Point. The only potentially impacted cultural resource in the proposed leased ocean areas that was cited during extensive discussions with community and kupuna groups in similar projects was the ‘ōpelu ko‘a (‘holes’ or schooling places for mackerel scad - *Decuprerus macarellus*) that occur in the general region.

The locations of these ko‘a are considered to be part of the traditional marine lore and are considered inappropriate for publication or for sharing outside of the families or community groups who have traditionally fished these ko‘a. ‘Ōpelu aggregations usually occur in waters around 120 feet (37 meters) deep, close to reef drop-offs and well shoreward of the farm area. An important aspect of the ‘ōpelu ko‘a tradition is the maintenance of these ko‘a by feeding of the school. To keep fish attracted to a ko‘a, a fisherman will regularly drop bags of palu – grated vegetable matter - to the school (daily or every other day). Kupuna from the Kekaha district stated that the ‘ōpelu ko‘a along the north of Keahole Point are not currently ‘fed’ or fished by either commercial or recreational/artisanal fishermen. However, the knowledge of the names and locations of the ko‘a are considered of historical significance and is a tradition that the kupuna would like to see preserved and passed on to future generations (refer to transcript from Kupuna Meeting, on Black Pearls Inc.’s web site: www.blackpearlsinc.com) (KBWF 2003). The ko‘a are highly prized resources and can be considered as an ATI. Prior to the 1801 lava flow that inundated the area, Keāhole was the site of the largest fish pond in the Hawaiian islands - one so large that a canoe was used to traverse from one side to the other (KBWF 2003). Fish farming could therefore be considered historically and traditionally appropriate to the area.

Impacts under Alternative 2 are similar to impacts under the Proposed Action.

Less Than Significant Impacts

TCPs/ATIs. As in the open ocean lease site for the Proposed Action, there is the possibility that the open ocean lease area for Alternative 2 may overlap with traditional fishing areas used by fishermen. The Alternative 2 ocean lease site offshore Keahole Point may result in some conflict with trolling at this depth contour. The presence of the OOA platforms would likely reduce access to areas that fishermen would otherwise had open access to in the past. Nonetheless, because of the large expanse of the ocean used for fishing in this area, the impact is considered less than significant. Therefore, it is concluded that under Alternative 2, there would be less than significant impacts to ATIs in the lease portion of the open ocean area in Kona

No Impacts

Historical Buildings and Archaeological Resources. There are no historical buildings or documented archaeological resources within the ROI.

Beneficial Impacts

Presences of the platforms may increase opportunities for increased catches and greater regularity of catches for traditional fishermen in the area.

Alternative 3 - No Action***No Impacts***

Under the no action alternative, the current level of activities would not change and the overall effect would be no impacts. Because of the paucity of benthic and fish resources within this depth range on the bare sand bottom, fishermen practicing subsistence fishing may not choose to fish within the ROI. There would be no changes to the cultural resources currently available to the Native Hawaiians.

2.12 ALTERNATIVES ANALYSIS

2.12.1 Affected Environment

Introduction/Region of Influence

There were three alternatives evaluated in this DEIS, the Alternative 1 (which was selected as the Proposed Action), Alternative 2 site, and Alternative 3 (which is the No Action Alternative). Each section above addresses the specific topic area for all three alternatives, describes the potential impacts for each alternative and offers a chart comparing the potential impacts. This section summarizes the three different alternatives, compares and contrasts them, and explains why the Proposed Action site was selected, and the Alternative 2 site was rejected, and the Alternative 3 No Action Alternative was also rejected.

Project Location for Proposed Action – Malae Point (Preferred Alternative)

As described above, the Hawaii Oceanic Technology Ahi Aquaculture Project will be operating from an ocean lease site based three miles (2.6 nautical miles (nm)) offshore Malae Point in North Kohala. The open ocean aquaculture operations and ocean platform site will be off the North Kohala Coast approximately three miles (2.6 nautical miles) directly offshore (southwest) of Malae Point (Figure 1-1). The land-based support for every day ocean operations will be in Kawaihae Commercial Harbor (Figure 1-2).

The harvested fish will be transported from the proposed ocean lease site by boat directly to 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. Alternatively, the company may utilize Hilo Harbor and the existing fish packing facility in Hilo for processing the ahi should the Kona vendor not be available. Feed storage and feed transport to the feed boat will take place from Kawaihae Commercial Harbor.

At the Proposed Action site, the platforms will be 2.6 nm offshore and will be outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS), shown in purple in Figure 1-1. The area proposed for leasing is 247 acres (1.0 square kilometers) and will contain 12 platforms, which will produce 6,000 tons of Ahi per year.

The platforms will be evenly distributed in the lease site, as shown in Figure 1-3. The water depth at the site is 1,320 feet (402.34 meters); the top of the platforms will be held at a depth of 65 feet (20 meters) below the water surface.

Project Location for the Alternative Site 2 – Keāhole Point

The project location for the proposed open ocean platform site is the only difference between Alternative Site 2. The open ocean aquaculture operations and ocean platform site will be off the North Kona Coast approximately three miles (2.6 nautical miles) due west of Keāhole Point (Figure 1-10). As with the Proposed Action, the land-based support for every day ocean operations, feed storage and feed transport to feed boats will take place at Kawaihae Commercial Harbor (Figure 1-2).

At the Alternative 2 site, the platforms will be 2.6 nautical miles offshore and will be outside the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS), shown in purple in Figure 1-10. The size of area proposed for leasing is the same as the Proposed Action site at 242 acres (1.0 square kilometers) and will contain 12 platforms, which will produce ~~6,000~~12,000 tons of Ahi per year.

Just as in the Proposed Action site, the platforms will be evenly distributed in the center of the Alternative 2 site off Keahole Point, as shown in Figure 1-11. Map of lease area centered at 19°43' 40.00" N 156°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.

Alternative 3: No Action Alternative

Under the no action alternative, Hawaii Oceanic Technology would not proceed with the development of the Ahi Aquaculture Project

Operations

Operations for the Hawaii Oceanic Technology Ahi Aquaculture Project are identical between the Proposed Action and the Alternative 2 site, except the distance from Kawaihae Commercial Harbor to the Alternative 2 site is much further and would require more fuel and time for the working vessels to reach the ocean lease site.

Open Ocean Platforms

The description of the open ocean platforms and distribution within the leased area is the same for the Proposed Action and for Alternative 2.

Feeding

Feeding methods and frequency are the same for the Proposed Action and for Alternative 2.

Platform Maintenance and Tuna Health Inspections

The platform maintenance and tuna health inspections are the same for the Proposed Action and for Alternative 2.

Harvesting

The harvesting information is the same for the Proposed Action and for Alternative 2.

2.12.2 Comparison of Alternatives

The following chart summarize the comparison of alternatives relative to their potential impacts. Details about these conclusions are found above in the individual sections.

**Table 2.12-24
Summary of Potential Impacts of Implementing the Ahi Aquaculture Project Proposed Action,
Alternative 2, and the No Action Alternative**

Impact Issues	Proposed Action	Alternative 2	Cumulative	No Action Alternative
Geology, Sediments, Soils and Topography	○	○	○	○
Land Use and Aesthetics	⊙	⊙	⊙	○
Ocean Use	⊙	⊙	⊙	○
Water Quality	⊙	⊙	⊙	○
Biological Resources	⊙	⊙	⊙	○
Waste Management	⊙	⊙	⊙	○
Traffic	⊙	⊙	⊙	○
Air Quality	○	○	○	○
Socioeconomics	○,+	○,+	○,+	○
Emergency Services	⊙	⊙	⊙	○
Cultural Resources	⊙	⊙	⊙	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. None of the significant impacts in the cumulative impacts column are attributable to the Ahi Aquaculture Project or no action.

LEGEND:

- ⊗ = Significant impact
- ⊙ = Significant but mitigable to less than significant impact
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact
- N/A = Not applicable

There are more similarities than differences between the Proposed Action site and the Alternative 2 site. The size of the proposed ocean lease area is the same and the operations are the same, including the size and number of platforms, feeding, platform maintenance, tuna health inspections, and harvesting. Both ocean lease locations will utilize the same land base for operations at Kawaihae Commercial Harbor.

The main differences in the environmental setting between the Proposed Action site and the Alternative 2 site are the greater depth of water at the Alternative 2 site; the greater distance from Kawaihae Commercial Harbor to the Alternative 2 site; the higher number of vessels utilizing the ocean region around Alternative 2, and the higher number of spinner dolphin resting areas located on the adjacent coastal waters.

The Proposed Action site was selected over the Alternative 2 site primarily because of the greater distance the work vessels would need to travel to get to the Alternative 2 site from Kawaihae Harbor, the greater fuel costs that would be incurred, and the greater wear and tear on the vessel from the longer trip. In addition, there appeared to be a greater potential for some conflicts of use with trollers in the Alternative 2 site because of the higher number of vessels using the area. While there are a greater number of spinner dolphin resting areas identified in the coastal waters adjacent to the Alternative 2 site, this was not considered a decisive factor since the open ocean aquaculture site is located 2.6 nm away from shore, in waters not frequented by spinner dolphins.

The No Action Alternative was not selected since it would not enable the company to achieve its goal of sustainable aquaculture production in Hawaii.

CHAPTER 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:

- *Continued viability in Hawaii's sugar and pineapple industries.*
- *Continued 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 (Hawaii State Plan 1991: 4).*

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

- *Support research and development activities that provide greater efficiency and economic productivity in agriculture.*
- *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. (Hawaii State Plan 1991: 4)*

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. (Hawaii State Plan 1991: 7).*

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 (Hawaii State Plan 1991: 7).*

There are a variety of priority guidelines identified in the Hawaii State Plan to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy. These include the following three which are relevant to the Proposed Action:

(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements....

(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:

(A) An industry that can take advantage of Hawaii's unique location and available physical and human resources.

(B) A clean industry that would have minimal adverse effects on Hawaii's environment.

(C) An industry that is willing to hire and train Hawaii's people to meet the industry's labor needs at all levels of employment.

(D) An industry that would provide reasonable income and steady employment....

(10) Enhance the quality of Hawaii's labor force and develop and maintain career opportunities for Hawaii's people through the following actions:

(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible. (Hawaii State Plan 1991: 17)

The Proposed Action is consistent with these State Plan priority #2 because the construction and deployment of the Oceanspheres represents industry development and commercialization of technological advancements in ocean engineering and open ocean aquaculture. It would be a positive step for this priority.

The Proposed Action is also consistent with the State Plan priority #8 to encourage private initiative to develop industries which promise long-term growth potentials. A high quality ahi product offers long-term growth potential in a world export market.

The Proposed Action is consistent with State Plan Priority 8(A) because open ocean aquaculture takes advantage of Hawaii's unique location with access to deep clean waters close to shore in the middle of the Pacific. The project also takes advantage of the local human resources with experience working at sea in commercial vessels, using SCUBA, and other technical skills.

The Proposed Action consistent with State Plan Priority 8(B) because it is an open ocean aquaculture operation, which is part of a clean industry with minimal adverse impacts on environment;

The Proposed Action is consistent with State Plan Policy 8C as they have already shown their commitment to hire and train Hawaii's people to meet their needs for technical employees. As described above, they are supporting two UH Hilo students to get trained in ahi spawning and cultivation techniques.

The Proposed Action is also consistent with the State Plan Priority #10 because it will enhance the quality of Hawaii's labor force and develop and maintain career opportunities by participating in vocational training in aquaculture.

The Proposed Action is consistent with the State Plan Priority #8(D) because the company projects to be able to provide reasonable income and steady employment for its work force.

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. This section will address two functional plans, one for agriculture, the other for conservation lands.

The Hawaii State Plan Agriculture State Functional Plan (1991) identifies problems, assesses issues, and summarizes the implications for Functional Plan strategy in the numerous areas. Aquaculture is considered an agricultural commodity industry. The Agriculture Functional Plan advocates to "...increase the production and growth of Hawaii's agricultural commodity industries through cultural and management practices" (Hawaii Agriculture State Functional Plan 1991: II-2).

Two top priorities of the Hawaii Agriculture State Functional Plan are:

- *There is a need to increase the productive agricultural use of lands most suitable and needed for agriculture.*
- *There is continuous need for the efficient and equitable provision of an adequate supply of water for agricultural use (Hawaii Agriculture State Functional Plan 1991: II-3).*

In Hawaii legal terms, the word "land" also includes submerged lands and ocean waters. So, it can be argued that the State Functional Plan is advocating for an increase in the productive use of ocean areas most suitable and needed for aquaculture.

The Proposed Action is consistent with the Hawaii Agriculture State Functional Plan since it would significantly increase production and growth in the open ocean aquaculture industry in Hawaii. There are currently two permitted open ocean aquaculture operations in the State of Hawaii. Hawaii Oceanic Technology is seeking to be the first untethered open ocean aquaculture system for deep water environments.

Aquaculture is a top priority agricultural activity as shown through the work of the Aquaculture Development Program of the Hawaii Department of Agriculture. Through this program, ADP provides assistance in planning and coordination, information dissemination, business counseling, marketing, animal health management, and research and extension funding.

The Proposed Action is consistent with the goals of the Hawaii Department of Agriculture for the development of open ocean aquaculture industry in Hawaii. Hawaii Oceanic Technology has benefitted from the technical services provided by the Aquaculture Development Program.

Of the objectives in the Conservation Lands Functional Plan, several are relevant to the Proposed Action, including:

Protection of fragile or rare natural resources.

Enhancement of natural resources.

Appropriate development of natural resources.

The Proposed Action is designed to minimize any potential negative impact on fragile or rare natural resources such as marine mammals. The lack of anchors, lines and loose nets, and its location 2.6 nm from shore are all effective mitigation and serve as protective measures.

The Proposed Action is consistent with the objective of enhancing natural resources. By allowing for the Proposed Action, more ahi will be provided to the market without any increased pressure on wild stocks of ahi other than the minor impact of the capture of 7 ahi individuals each year to refresh the broodstock.

The Proposed Action is consistent with the objective for appropriate development of natural resources. Aquaculture is a consistent use of the Resource Subzone of this Conservation Land.

3.1.5 Chapter 205A relating to Coastal Zone Management:

The proposed project complies with the provisions and guidelines contained in Chapter 205A where applicable. The relationship between the proposed project and the Coastal Zone Management (CZM) program is discussed relating to objectives of Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection and Marine Resources.

The CZM objective and policies relating to Recreational Resources is to provide coastal recreational opportunities accessible to the public by protecting those coastal resources uniquely suited for recreational purposes, and providing adequate access and shoreline parks. This project does not interfere with coastal recreational opportunities.

The CZM objective relating to Historic Resources is to protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the CZM area that are significant in Hawaiian and American history and culture. The policies are to identify and analyze significant archeological resources, maximize information by preserving remains, and support state goals to protect, restore, interpret and display historic resources. This project complies with this objective through its analysis of cultural and historic resources in the proposed site and along the adjacent shoreline.

The CZM objective relating to Scenic and Open Space Resources is to protect, preserve and restore and improve the quality of coastal scenic and open space resources. The policies are to design and locate developments to minimize existing public views. This project is consistent with this objective and policy by siting its ocean lease site nearly three miles from shore so the visual impact is minimal.

The CZM objective relating to Coastal Ecosystems is to protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems. The policies include preserving valuable coastal ecosystems, including reefs, or significant biological and economic importance. The project's design enables the aquaculture operation to be located in deep water far from shore. Water quality modeling shows that there will be no negative impact on coastal ecosystems from this project. Impacts on fisheries are also minimized by the project site's distance from nearshore fisheries and bottomfish fishing grounds.

The CZM objective relating to Economic Uses is to provide the public with public or private facilities and improvements important to the State's economy in suitable locations. The policies are to ensure that coastal dependent development are located, designed and constructed to minimize social, visual and environmental impacts on the coastal zone management area. This project is consistent with this objective and policy as an economic activity suitably located 2.6 nm from shore in state waters of 1,320 feet deep. This location has allowed the proposed project to minimize any negative social, visual or environmental impacts of the project.

The CZM objective of Coastal Hazards is to reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution. The policies are to control development in areas subject to coastal hazards. This project is consistent with this objective and policy since its location in 1,320 feet of water, 2.6 nm from shore is not subject to the damaging effects of such coastal hazards.

The CZM objective of Public Participation is to stimulate public awareness, education and participation in coastal management. The policies are to promote public involvement in the coastal zone management processes, and organize workshops on coastal issues and conflicts. This project is consistent with this objective and policies as shown by the community outreach and dialog it has undertaken in the local community as described in section 4.7 of the FEIS.

The CZM objective of Beach protection is to protect beaches for public use and recreation. This project is consistent with this objective by having no impact on beaches.

The CZM objective relating to Marine Resources is to promote the protection, use and development of marine and coastal resources to assure their sustainability. The policies are to ensure that the use and development of these resources is sustainable, and to coordinate the management of these resources to improve effectiveness. This project is consistent with this objective and policies as it is a sustainable use of Hawaii's ocean space and its fishery resources to grow fish in an environmentally-friendly way for local consumption and export.

3.1.6 Hawaii Ocean Resources Management Plan:

This plan has five year management goals and strategic actions that are directly relevant to this proposed action. Within “Perspective 2: Preserving our Ocean Heritage” is a management goal to “encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection.” To achieve this management goal are three strategic actions including, “Promote alternative ocean energy sources; plan and develop sustainable commercial aquaculture in coastal areas and ocean waters; and expand ocean science and technology.” Hawaii Oceanic Technology’s proposed project is in conformance with all of these management goals in the Hawaii Ocean Resources Management Plan. The proposed ahi aquaculture project will directly support implementation of those strategic actions identified in the Hawaii Ocean Resources Management Plan (DBEDT OP 2006).

3.2 RELATIONSHIP TO COUNTY STATUTES, PLANS AND POLICIES

3.2.1 Hawaii County General Plan

The Hawaii County Council approved the most recent version of the County General Plan in February 2005, and amended it in 2006. The proposed ocean lease site is not in the Land Use Planning Allocation Guide map, nor under County jurisdiction. However, the Kawaihae Commercial Harbor, where the land base of the operations will take place, is within the State Commercial Harbor and identified in the LUPAG map as “Urban Expansion, Low, Medium and High Density Industrial..”

3.2.2 North Kohala 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 (CDP) was approved by the Hawaii County Council. The North Kohala CDP does not specifically include the ocean area, since the ocean is not under County General Plan jurisdiction. However, the CDP does include some references that could relate to the proposed project, especially related to protecting viewplanes of the ocean from land, protecting the coastal lands adjacent to the proposed ocean lease site, and promoting agriculture.

According to the North Kohala CDP,

*The over-arching **Goal** for achieving the desired **Growth Management** in Kohala is summarized as:*

GOAL: Direct North Kohala’s growth to areas within and near existing town centers in order to preserve the district’s open space and cultural resources; and to promote agriculture.

There are nine strategies to implement the over-arching Goal. Of these, two relate to the proposed action:

Strategy 1.4: Promote and Support a Community of Diversified Agriculture

Strategy 1.9: Establish a View Plane Protection Program to identify and protect areas of significant beauty along the Kohala Mountain Road and Akoni-Pule Highway corridor. (North Kohala CDP: 27)

Under Strategy 1.4, related to agriculture, the relevant goal is that “...the Kohala community will produce 50% of the food it consumes.” (North Kohala CDP, 2008: 134).

The Proposed Action is consistent with this strategy by increasing the amount of ahi that is produced locally that is consumed locally. Though the main markets for the cultured ahi tuna are the US west coast and Japan, there will be some ahi sold on the local market. So, the Proposed Action is consistent with the strategy by increasing local production of locally-consumed ahi.

Under Strategy 1.9 related to view plane protection, the CDP says the North Kohala CDP Action Committee will

- *identify view planes of significant beauty along the Kohala Mountain Road and Akoni-Pule Highway; and*
- *identify potential programs and regulations to protect the view planes from development and/or encroachment (North Kohala CDP: 39).*

The coastal area adjacent to the proposed ocean lease site is identified in the North Kohala Environmental and Cultural Concept Map as having “a high concentrations of cultural sites” on the maps of the North Kohala CDP (North Kohala CDP: 25).

The company recognizes that the view plane from the Akoni-Pule Highway of the ocean area where the proposed ocean lease is located would be considered a view plane of significant beauty.

Relating to public access, the lands at Kiʻiokalani, Puaiki and Puanui were identified as mauka-makai access roads to the coastal trail. This was part of the long-range access plan of a coastline trail from Polulu to Kawaihae, and drivable mauka-makai access roads. In the recommendations for the mauka-makai access roads was the following:

Puanui, Puaiki and Kiʻiokalani ahupuaʻa – vehicular access on an existing jeep road over State land and Ponoholo Ranch, Ltd. Land TMK 5-9-03 to Mālaʻe Point. Also over Kamehameha Schools land TMK 5-8-01:8 to Wawaionu Bay.” (North Kohala CDP: 53).

This recommendation as a site for mauka-makai access also reflects the public value of the view planes from the coastal land adjacent to the proposed ocean lease site.

The Proposed Action is consistent with view plane protection in this area because the additional work vessels and visible tops of the Oceansphere for 4 hours/day are not anticipated to cause a noticeable impact on the viewplane from shore. It was noted by those interviewees using the coastal lands adjacent to the proposed ocean lease site that the distance from shore resulted in the proposed project having no impact on the viewshed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won’t make a difference. The addition of the proposed project’s work boats and the tops of Oceanspheres, will have no impact on the

cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho‘opai 2008, Hanohano 2008, Akau 2008).

With this conclusion in mind, the Proposed Action is consistent with the view plane protection strategy of the North Kohala CDP.

3.2.3 Hawaii County Zoning

The proposed ocean lease site is not under County jurisdiction, therefore has no County zoning.

According to the Hawaii County Planning Department, County zoning for the Kawaihae Commercial Harbor is MG-1a, which is “General Industrial – 1 acre.” The development of the land base of operations in the Kawaihae Commercial Harbor is industrial in nature and is consistent with the MG-1a County Zoning for the commercial harbor lands.

3.2.4 Hawaii County 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 complex is set aside to the Hawaii Department of Transportation Harbors Division and the land base of operations is consistent with the existing approved activities in the commercial harbor. No construction is envisioned at the Kawaihae Commercial Harbor lease site that would trigger an SMA permit. However, if a building is not available for lease at the Kawaihae Commercial Harbor, then the company may need to lease undeveloped land within the Kawaihae Commercial Harbor and build its own office and storage facilities. This would require SMA permits and building permits from the County of Hawaii

3.3 PERMITS REQUIRED

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). And Coastal Zone Management Act, Marine Mammal Protection Act, and Magnuson-Stevens Fishery Conservation and Management Act. 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:

1. US Army Corps of Engineers: Department of Army Permit under Section 10 of the Rivers and Harbors Act
2. US Coast Guard: Special Use Permit
3. DLNR/OCCL: State Conservation District Use Permit
4. DOH: National Pollution Discharge Elimination System Permit & Zone of Mixing Permit
5. DLNR/DOA: Aquaculture License
6. DBEDT – Office of Planning, Hawaii Coastal Zone Management Program: Federal Consistency Determination
7. County of Hawaii: SMA permit and building permit if the company is unable to lease an existing building and must make improvements to an undeveloped lot at Kawaihae Harbor for land base of operations

CHAPTER 4

OTHER REQUIRED ENVIRONMENTAL ANALYSES

4.1 INTRODUCTION

Chapter 2 included an analysis of cumulative impacts, geology, land use and aesthetics, water quality, biology, waste management, traffic and transportation, air quality, socioeconomic conditions, emergency services, cultural impacts and analysis of the alternatives.

In addition to the analyses of cumulative impacts presented in Chapter 2, HRS 343 requires additional evaluation of the project's impacts with regard to the following:

- Probable adverse impacts which could not be avoided;
- Summary of unresolved issues;
- The relationship between local short-term uses of the environment and long-term productivity; and
- Any irreversible or irretrievable commitment of resources.

HRS 343 also requires that an EA discuss the agencies and members of the public who have been consulted during preparation of the document.

4.2 PROBABLE ADVERSE IMPACTS WHICH COULD NOT BE AVOIDED

There are no probable adverse impacts which are expected to occur with the Proposed Action. Any potential adverse impacts have been mitigated by the design of the aquaculture platforms without any mooring lines; and by locating the Proposed Action away from the nearshore waters where most fishers and boaters and other cultural activities are located, away from where spinner dolphins rest during the day, and away from the area within 100 fathom depth that is most frequented by humpback whales.

While there is a recognition that the aquaculture platforms may attract fish to aggregate around them, this is viewed by some fishermen as a potential benefit, and viewed by some as a potential adverse impact. The potential impact will be mitigated by allowing the fishers to fish close to the aquaculture platforms, and thereby benefit directly from any fish aggregation that occurs at the Proposed Action site.

4.3 SUMMARY OF UNRESOLVED ISSUES

There are no unresolved issues that have not been addressed in this DEIS through project design, operational protocols, best management practices and mitigation. There are pending permits that are not completed at this time.

4.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term damage to the environment relating to the Proposed Action and Alternative 2 would be limited. No significant impacts were identified that could not be mitigated to a less than significant level.

The long-term productivity of the environment will not be lessened by the Proposed Action as shown in the analysis in Section 2.4 on Water Quality and 2.5 on Biological Resources. Ongoing environmental monitoring will be done to ensure protection of the environment. Long term productivity of the open ocean aquaculture industry would be enhanced by the Proposed Action, which would help meet the high market demands of fish by providing a sustainable source of high quality, pure, clean tuna through open ocean aquaculture. The Proposed Action is designed to meet these production goals and enhance the quality of life and welfare of its staff and the quality of the natural environment.

4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

HRS 343 requires an analysis of the extent to which the proposed project's primary and secondary effects would commit nonrenewable resources to uses that would be irretrievable to future generations. Implementing the Proposed Action or Alternative 2 would require committing both renewable and nonrenewable energy and material resources for open ocean aquaculture operations, such as the fuel used by vehicles and work boats; the increases in water, power, and other resources necessary to maintain and operate facilities for the new personnel; and the increase in local resources required to support the additional personnel and their families.

However, there will be no irreversible or irretrievable commitment of natural resources to this project since Chapter 190D HRS, as amended, specifically requires any lessee vacating an ocean lease to remove all equipment and to restore the site to its original condition. It has been the case with the two ocean leases granted to open ocean aquaculture operations in the state, the lessees are required to purchase comprehensive insurance for recovery and removal of any lost or damaged farm materials, and for any other damage that might be inflicted by the farm.

4.6 AGENCY CONSULTATION

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. Figure 4-1 below lists details about these agency consultations

Hawaii Oceanic Technology is currently in the process of obtaining a Conservation District Use Permit and has filed the necessary applications.

4.7 PUBLIC PARTICIPATION

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 4-1 below lists details about the community outreach and stakeholder consultation.

Figure 4-1: 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	Met with Federal Officials at conference
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
DOT Harbors Division, Hawaii District Manager	5/10/2007	Office Visit
NOAA, National Marine Fisheries Service	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
<u>Kawaihae Resource Council Meeting</u>	<u>4/5/2009</u>	<u>Informational Booth</u>

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

CHAPTER 5

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CHAPTER 6

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APPENDIX A
USER AND VESSEL SURVEYS

Site Specific User Surveys for North Kohala and Keahole Point Ocean Lease Sites

In order to document the uses and recreational activities adjunct and within the ocean lease site there were six onsite observational surveys, in-person interviews and phone interviews of potential commercial and private boaters conducted around the proposed North Kohala lease site and Alternative Site of Keahole Point.

Observations at Malae Point

Date: August 24, 2007
Location: Malae Point, North Kohala, Hawaii
Observer: Paul Troy

The observation station was situated off of the dirt ocean access road located at mile 9 on Akoni Pule Hwy north of Kawaihae Harbor in North Kohala. Observations were made with the aid of binoculars from an elevated position on Malae Point and recorded in a journal. Below is a photograph of Malae Point taken on the day of observation, with the ocean lease site located directly off shore of the point and a small beach area just right of the point. There is a small access dirt road which winds to the beach. All activity in the area was recorded for a one hour observation period which started at 12:10 pm.



OBSERVATIONS:

- (1.) A small trolling fishing boat of approximately 20 feet length was observed making its way up the North Kohala Coast in a northward direction approximately 500 yards off of the coast. The fishing boat was first spotted 5 miles south of Malae Point and made its way north of the point by the end of the observation period. The vessel passed well near shore of the lease area.
- (2.) A second fishing boat of approximately 30 feet length was observed approaching Malae Point from the North. The second boat was trolling

approximately 500 yards off of the coast heading in a southerly direction. The vessel passed well near shore of the ocean lease site.

- (3.) There were four pickup trucks observed around Malae Point that day. Three pickup trucks were parked by the shore with about three to four persons each. There was on shore fishing and family picnicking activities on the beach. One pickup truck was engaged in four wheel driving.
- (4.) No vessels entered the ocean lease site area of 300 acres during the observation period.

Shipboard Observations of North Kohala Ocean Lease Site

Date: September 14, 2007
Location: Inside Ocean Lease Site and one mile south
Observer: Paul Troy

Observations were taken from a ship located in the middle of the lease site located at 20° 05' 40.00 N 155° 55' 40.00 W, which is 2.6 nautical miles due south west of Malae Point on the Island of Hawaii and at a control station located one mile up current or south east from the center of the lease site. The bathymetry of the ocean lease site is located over a steep ocean cliff and is in 1342 feet of water.

OBSERVATIONS:

- 1.) No vessels entered the ocean lease site or adjacent area during the one hour observation period.
- 2.) There were no vessels observed at the control station during the one hour observation period.
- 3.) Vessel traffic was light in the North Kohala Coastal Zone that day.
- 4.) Two large trigger fish were found near the surface close to the boat.

Alternate Site Keahole Point Boat Survey

Date: April 24, 2008
Time: 10:00 to 11:00 HST
Location: Inside Alternate Ocean Lease Site and one mile south
Observer: Paul Troy

Observations were taken from a ship located in the middle of the lease site located at 19° 43' 37.25" N 156.06' 31.98" W which is 2.6 nautical miles due west of Keahole Point on the Island of Hawaii and at a control station located one mile up current or due south from the center of the lease site. The bathymetry of the ocean lease site is located over a steep ocean cliff and is in approximately 3000 feet of water.

OBSERVATIONS:

- 1.) No vessels entered the ocean lease site or adjacent area during the one hour observation period.
- 2.) A medium sized fishing vessel was located about two miles west of the alternate lease site.
- 3.) There were no vessels observed at the control station during the one hour observation period.
- 5.) Four to five small to medium size fishing vessels were observed in the area. Vessel traffic was moderate in the Keahole Point coastal zone and two Kona Blue vessels were located three miles from the ocean lease site.
- 6.) A small pod of Pilot Whales (4 to 6) were located one mile off shore from the Harbor entrance, about three miles due south east from the lease site.

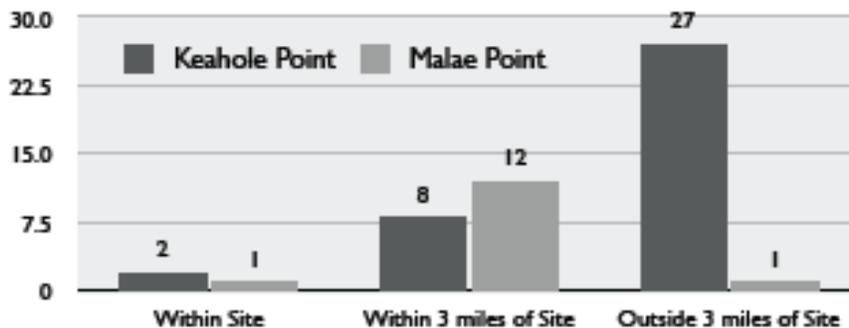
User Surveys at Preferred Action, Malae Point and Alternate 2, Keahole Point

Onshore Malae Point Observations were conducted to determine and compare vessel traffic around the two proposed site areas, of Malae Point and Keahole Points. The observer remained stationary in a position where the proposed ocean areas and their surrounding waters were visible at all times. Detailed notes of vessel traffic were kept for up to 9.5 consecutive hours. Each site was surveyed at least twice. Additional detailed data were collected for the Malae Point area.

Maximum Vessels in Site Area At Any One Time

Site	Within Site	Within 3 miles of Site	Outside 3 miles of Site
Keahole Point	2.0	8.0	27.0
Malae Point	1.0	12.0	1.0

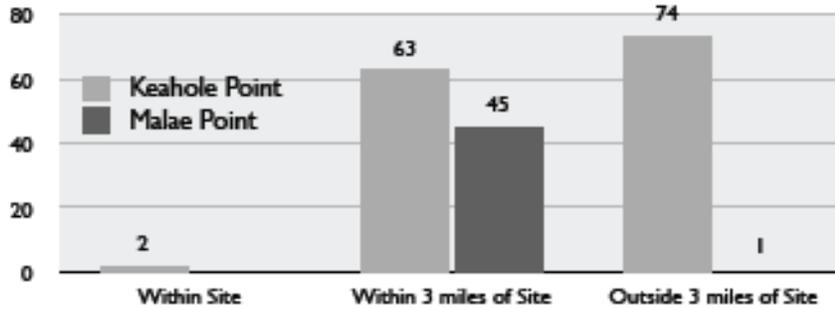
MAXIMUM VESSELS IN SITE AREA AT ANY ONE TIME



Average Vessel Traffic Per Site Per Observation Period

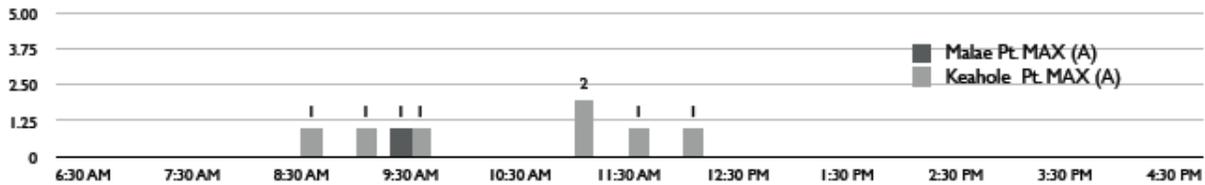
Site	Within Site	Within 3 miles of Site	Outside 3 miles of Site
Keahole Point	2.8	63.0	74.0
Malae Point	0.0	45.0	1.0

AVERAGE VESSEL TRAFFIC PER SITE PER OBSERVATION PERIOD

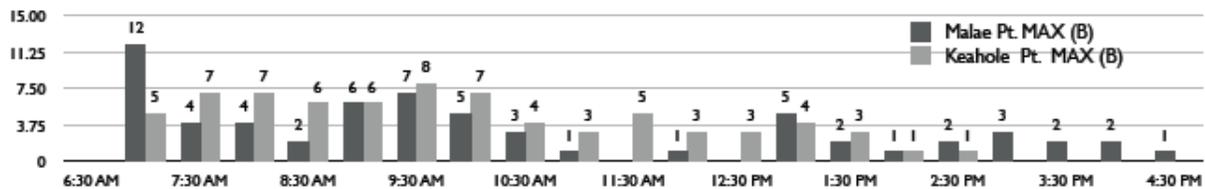


COMPARISON OF VESSEL TRAFFIC: KEAHOLE POINT AND MALAE POINT

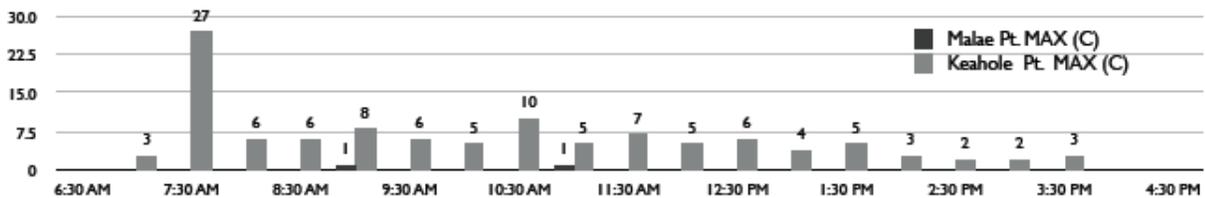
MAXIMUM VESSELS OBSERVED WITHIN PROPOSED SITE AREAS PER HALF HOUR



MAXIMUM VESSELS OBSERVED WITHIN 3 MILES OF PROPOSED SITE AREAS PER HALF HOUR

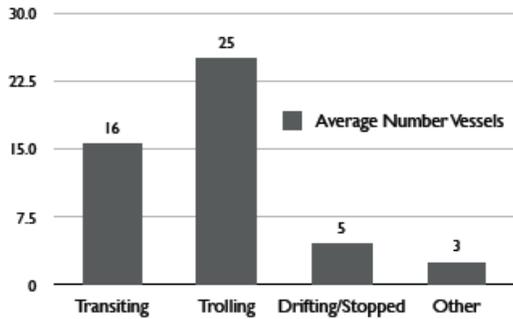


MAXIMUM VESSELS OBSERVED OUTSIDE 3 MILES OF PROPOSED SITE AREAS PER HALF HOUR



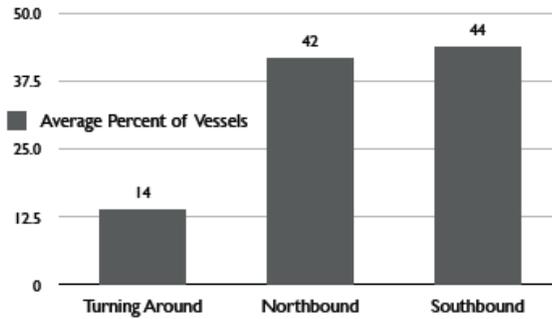
**MALAE POINT DETAILS WITHIN 3 MILES OF PROPOSED SITE AREA
(GREATEST VESSEL TRAFFIC AREA)**

VESSEL ACTIVITIES WITHIN 3 MILES OF PROPOSED SITE AREA



	Transiting	Trolling	Drifting/Stopped	Other
Avg # vessels	16.5	25	4.5	2.5

DIRECTION OF VESSELS WITHIN 3 MILES OF PROPOSED SITE AREA



	Turning Around	Northbound	Southbound
Average Percent of Vessels	14	42	44

The term ‘vessels’ includes all watercraft: motorized boats, jetskis or other personal watercraft, kayaks, zodiacs/skiffs, and barges. Personal watercraft are counted individually, but are often used in groups.

Malae Point Observations: Vessel outside 3 miles of site area was uncovered barge. Covered barge traversed within 3 miles of site on offshore side of proposed ocean lease site. Keahole Point Observations: Outside 3 miles of Keahole Point, 18 kayakers were observed using nearshore waters and are included in vessel numbers. Frequent vessel traffic within 3 miles and outside of 3 miles of proposed area was Kona Blue barge and work boats. In general, Keahole Point has greater vessel traffic in the ocean area surrounding the proposed site location than the preferred location of Malae Point. This research provides a preliminary snapshot of vessel traffic in the two areas where the proximity of vessels to the proposed site areas is examined.

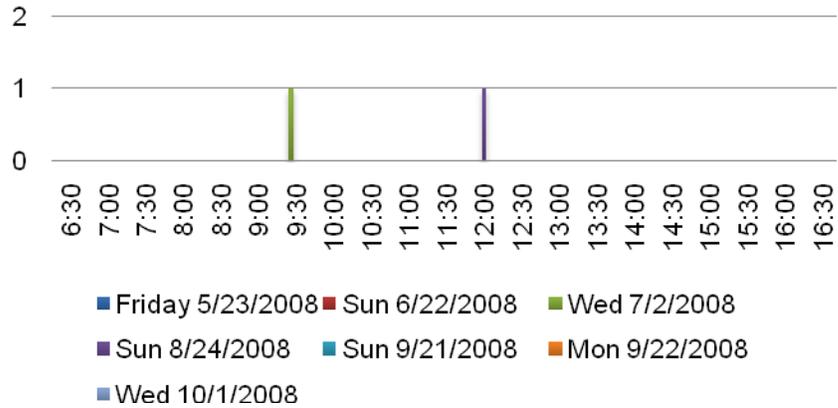
Extended Vessel Survey of Malae Point Ocean Lease Site

A survey of recreational activity in the general area north of Malae Point was conducted from August 2007 to October 2008 by HOT. The survey was conducted on seven summer days with low ocean swells and light trade winds. The timing of the survey was selected to ensure that it represented a period of heavy use on a weekend.

Observers were situated on Malae Point at 200 feet elevation and used a horizon measurement chart to estimate distance from shore. During the 46 hours of observation at the Proposed Action site data points were gathered and recorded. During the entire 46 hours

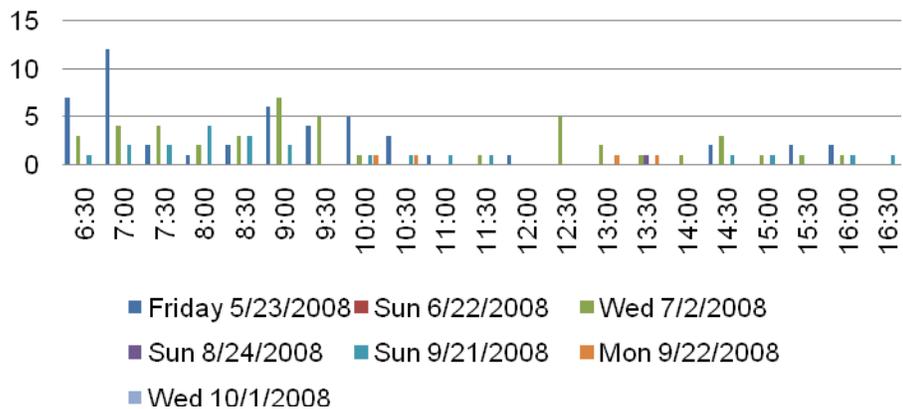
of observation at Malae Point only two vessels entered the ocean lease site and were in the area for less than a half hour period (see below).

Vessels Observed within Malae Point Ocean Lease Site



During the observation period a maximum of 12 vessels were traveling near the site within three miles but not inside the site (see below).

Vessels Observed Outside the OLS and within Three Miles



Most activity in the general Malae Point area consisted of trolling fishing vessels with some recreational dive boats. Most of the dive recreational activities are in shallower water (less than 100 feet) and most of the trolling is performed within one mile off shore. Few boats are expected to venture out into the Hawai'i Oceanic Technology operations area, which

would be located 3 miles (2.6 nautical miles) out to sea. Barge traffic utilizes a route that places the barges further west of the Proposed Action site.

Young Brothers, Ltd. and the Hawaii Superferry were informed about our location, and they found no navigational problems associated with the Ocean Lease Site Malae Point location. The harbor master (Ian Birnie) and harbor manger at Kawaihae Harbor were consulted also and they found no conflict of harbor operations with the Ahi Project operations.

Vessel activity in the area around the Alternative 2 site is more widely distributed than the Proposed Action site, with vessels utilizing the waters both east and west of the Alternative 2 site. Trollers also utilize the 1000 fathom contour, which is located somewhat west of the Alternative 2 site.

Malae Point and Keahole Point Users Interviews

Potential users of the North Kohala and Keahole Point ocean lease sites were interviewed by Steven VanKemp. All personal interviews were conducted in person either on store premises (SCUBA operators) or at Honokohau Harbor or Kawaihae Harbor over the course of two days at the end of August, 2007. All phone interviews were conducted over the course of two days at the beginning of September 14, 2007. The list of respondents, questions and responses are presented below.

List of Respondents

Commercial Diving and Sailing Operations

Method of Communication

Jacks Dive Locker	Personal Interview
Sandwich Isles Divers	Personal Interview
Big Island Divers	Personal Interview
Body Glove	Personal Interview
Kona Honu Divers	Personal Interview
Bottom Time	Phone
Mauna Lani Sea Adventures	Phone
Pacific Rim Divers	Phone
Living Ocean Adventures: Whale Watch/Fishing	Phone
Kalemera	Phone
Kohala Divers	Personal Interview
Mauna Wela	Personal Interview

Commercial, Recreational Fishers

Northern Lights	Personal Interview
Sun Downer	Personal Interview
Eclipse	Personal Interview
Hookele	Personal Interview
Bite Me II	Personal Interview
Ihu Nui Charter	Personal Interview
Sea Genie II	Personal Interview

Humdinger	Personal Interview
Golden Dragon	Phone
Anxious	Phone
Layla	Phone
Catchem 1	Phone
Reel Class	Phone
Illusions	Phone
Blue Hawaii	Phone
Alibi II	Phone
Autumn Marie	Phone
Grand Slam	Phone
Reel Pleasure	Personal Interview

Private Fishers

Sammy Lu II (Name of Boat)	Personal Interview
Private (No Name Obtained)	Personal Interview
Private (No Name Obtained)	Personal Interview
Private (No Name Obtained)	Personal Interview
Mike	Personal Interview
Steve	Personal Interview

Questions and Responses

1. Do You Operate Along North Kohala Coast Between Kawaihae Harbor and Hawi?

Total Participants	38		
Yes	7	18.42%	
No	31	81.58%	
Honokohau Users	32		
Yes	0	0.00%	
No	32	100.00%	
Kawaihae Users	6		
Yes	6	100.00%	
No	0	0.00%	

2. At What Depths Do You Operate Along This Coast?

Total	6	
0-99 fathoms	6	100.00%
100-499 fathoms	1	16.67%
500-1000 fathoms	0	0.00%
>1000 fathoms	0	0.00%

3. Do you regularly fish/operate around XX/ZZ buoy?

Total	38		
Yes		2	5.26%
No		36	94.74%
Honokohau Users	32		
Yes		1	3.13%
No		31	96.88%
Kawaihae Users	6		
Yes		1	16.67%
No		5	83.33%

4. Do you operate west of Keahole Point?

Total	38		
Yes		30	78.95%
No		8	21.05%
Honokohau Users	32		
Yes		29	90.63%
No		3	9.38%
Kawaihae Users	6		
Yes		1	16.67%
No		5	83.33%

5. At What Depths Do You Operate Around Keahole?

Total	30		
0-99 fathoms	21	70.00%	
100-499 fathoms	19	63.33%	
500-1000 fathoms	19	63.33%	
>1000 fathoms	9	30.00%	

6. Do you regularly fish/operate around buoy OT (OTEC Buoy)?

Total	38		
Yes		7	18.42%
No		31	81.58%
Honokohau Users	32		
Yes		7	21.88%
No		25	78.13%
Kawaihae Users	6		
Yes		0	0.00%
No		6	100.00%

7. What Depths Do You Usually Operate In?

Total	38	
0-99 fathoms	20	52.63%
100-499 fathoms	12	31.58%
500-1000 fathoms	23	60.53%
>1000 fathoms	6	15.79%

8. What Depths Do You Usually Operate In (Honokohau)?

Total	32	
0-99 fathoms	19	59.38%
100-499 fathoms	10	31.25%
500-1000 fathoms	23	71.88%
>1000 fathoms	6	18.75%

9. What Depths Do You Usually Operate In (Kawaihae)? *

Total	6	
0-99 fathoms	6	100.00%
100-499 fathoms	2	33.33%
500-1000 fathoms	0	0.00%
>1000 fathoms	0	0.00%

APPENDIX B
CURRENT STUDY REPORT

Analysis of Currents West of Hawaii Island in Relation to Open-Ocean Aquaculture

*Roger Lukas, Ph.D. Ocean and Air
Global Consultants LLC*

10/17/08

INTRODUCTION

This report is to present an analysis of the upper ocean currents west of Hawaii Island in the region of the proposed open-ocean aquaculture project. The open ocean aquaculture site is 2.6 nautical miles southwest of Malae Point. The center of the Ocean Lease Site is 20°05'40.00" N 155°55'40.00" W (Figure 1). The water depth at this location is 402 meters.

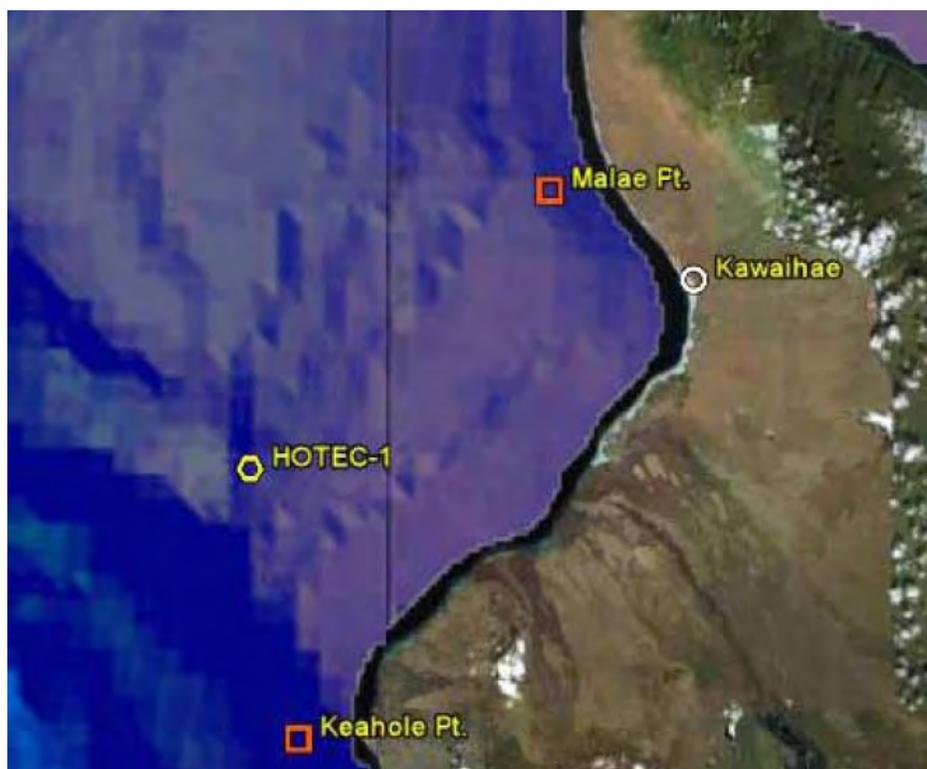


Figure 1. Region of Open Ocean Aquaculture site (orange box offshore of Malae Pt.). The location of moored current measurements is indicated as HOTEC-1.

Physical processes that contribute to the mean and variable flow in the region include the wind stress and its space-time distribution, tidal motions, and eddies. The long-term average surface currents in this general region are weak, ~ 10 cm/s towards the west (Lumpkin and Flament, 2001), but the actual currents at any particular time are often relatively strong (50 cm/s or more) and variable in direction because the region is dominated by eddies (Patzert, 1969; Lumpkin, 1998). The variance of sea level observed from satellite altimeters (Figure 2) clearly shows that the region west of Hawaii Island is subject to strong variability (Calil et al., 2008).

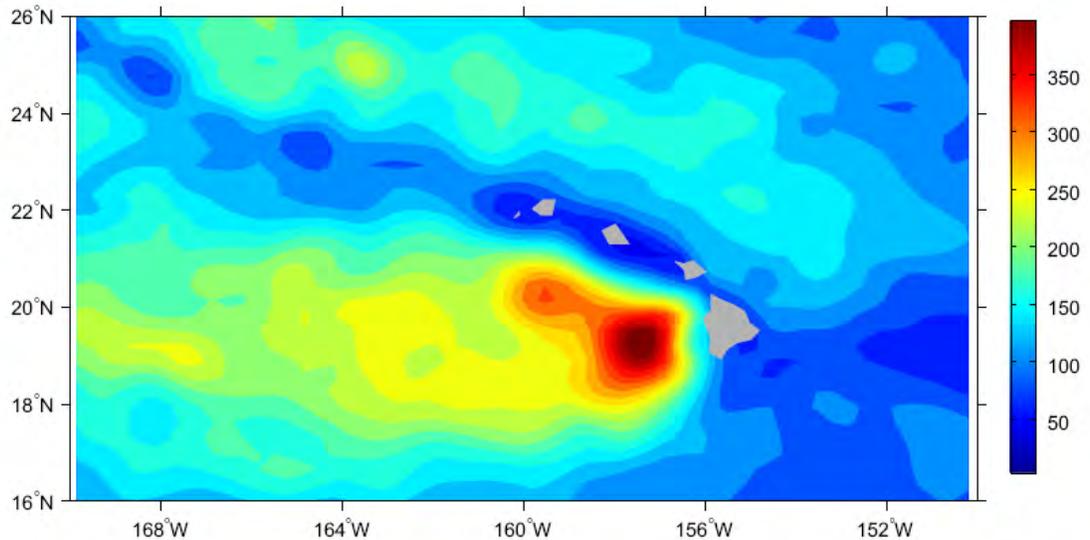


Figure 2. Mean eddy kinetic energy (cm^2/s^2), from 1992-2005, calculated from AVISO merged satellite altimetry (after Calil et al., 2008).

CURRENT OBSERVATIONS

Current measurements are available for the region west of Hawaii from OTEC environmental studies during the 1980s, from satellite-tracked surface drifters, and from shipboard during the recent E-Flux program. In addition, the Navy operational ocean analysis system combines the HyCOM (Hybrid Coordinate Ocean Model; Hurlburt et al., 2008) with ocean and atmospheric observations to estimate the state of the global ocean at very high (8 km) resolution.

Moored measurements

Moored current measurements at the HOTEK-1 location in Figure 1 were made by Edward Noda and Associates from December 1980 to April 1981. The water depth at this location is 1341 m. Currents were measured at depths of 54, 101, 151, 363, 771 m. This record is too short to establish the mean flow;

however it demonstrates the variability of flows that affect this area. Figure 3 shows that the current speed was rarely less than 10 cm/s. During the first half of the record, typical speeds were 20 cm/s with frequent increases to 40 cm/s. An event with maximum speeds of more than 80 cm/s towards the north occurred over a 20 day interval in the middle of the record. As the currents weakened, they veered towards the west and then southward. This was likely due to an anticyclonic eddy that formed close to, but north of the site and then propagated westward

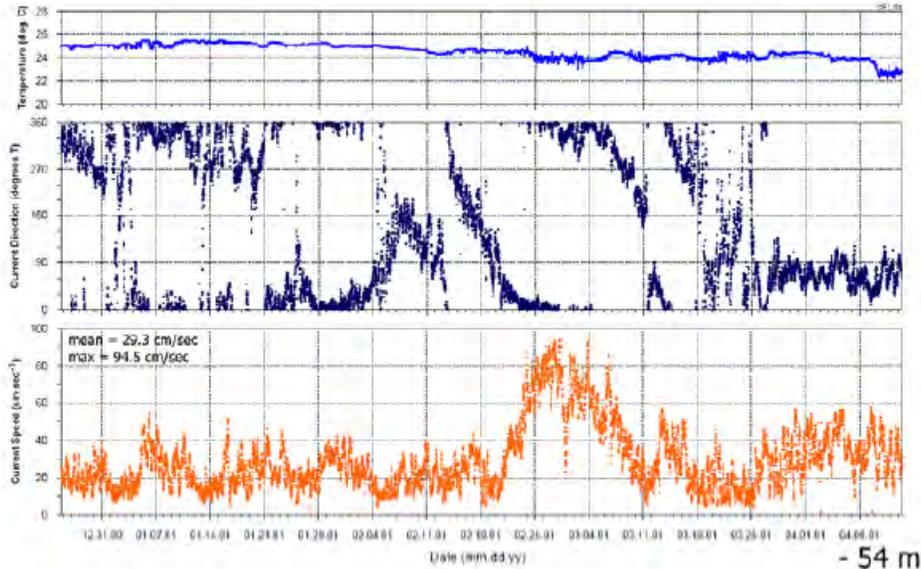


Figure 3. Temperature (top panel), current direction (middle panel) and current speed (lower panel) for the measurements at 54 m depth from the HOTEK-1 site.

Shipboard measurements

Several shipboard surveys of currents and water properties were made in the waters west of Hawaii during the E-Flux program (Dickey et al., 2008), with a focus on sampling the mesoscale eddies that are formed there associated with strong upwelling that is caused by the positive wind stress curl of the trade winds funneling between the mountains flanking the Alenuihaha Channel (Chavanne et al., 2002). Figures 4-6 show the currents measured by shipboard ADCP from 40 m depth during the E-Flux I, II and III cruises. These measurements show the strong, spatially variable upper ocean flows associated with mesoscale eddies in this region (Dickey et al., 2008).

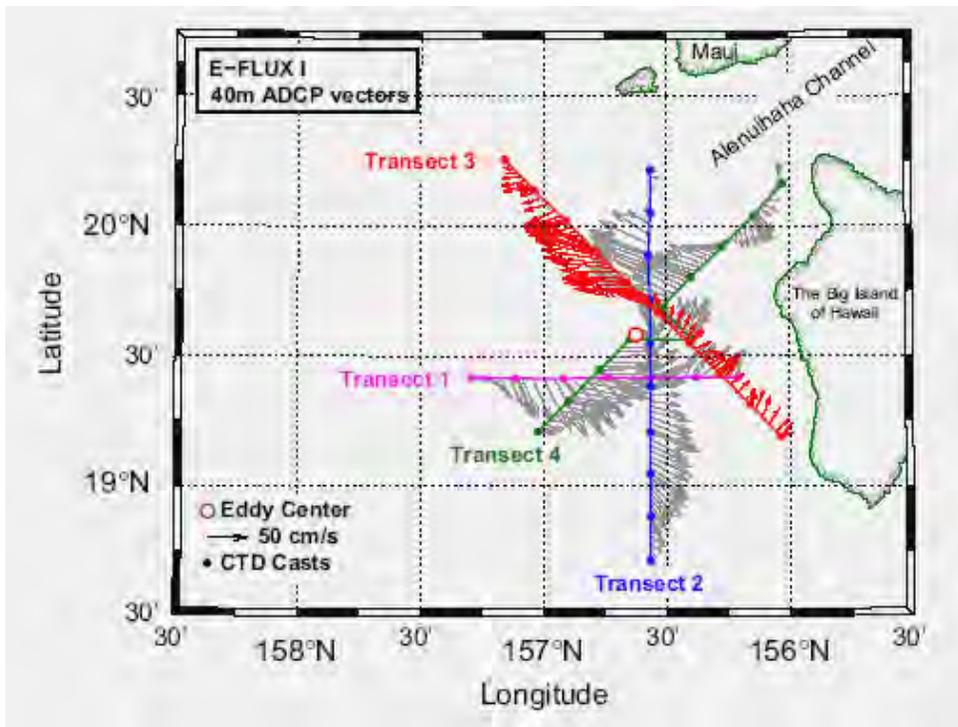


Figure 4. Currents at 40 m depth during the E-Flux I cruise, November 6-20, 2004.

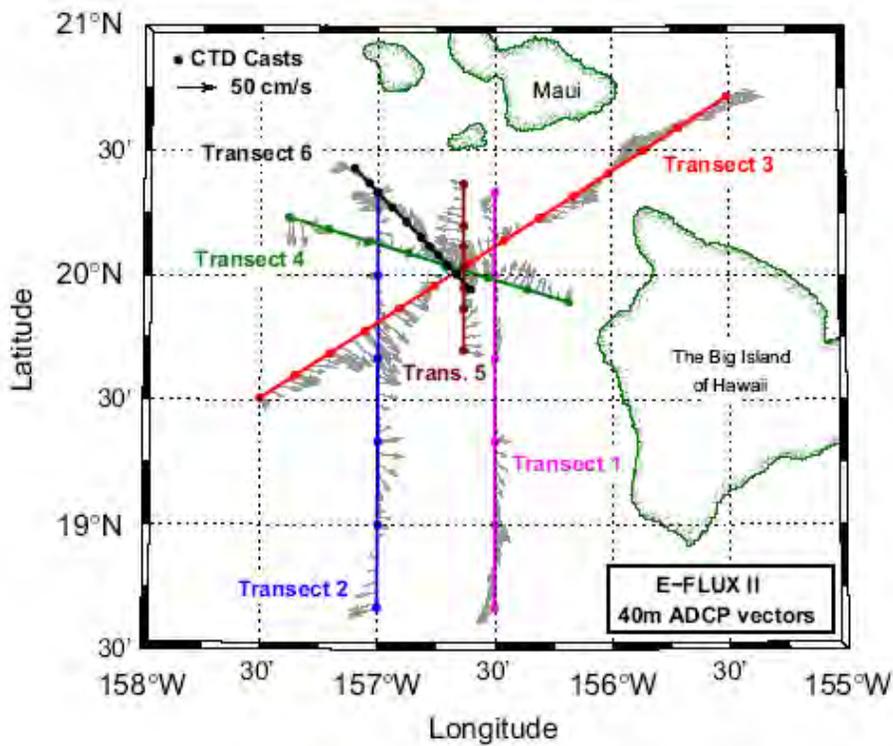


Figure 5. Currents measured at 40 m depth during E-Flux II cruise, January 10-19, 2005.

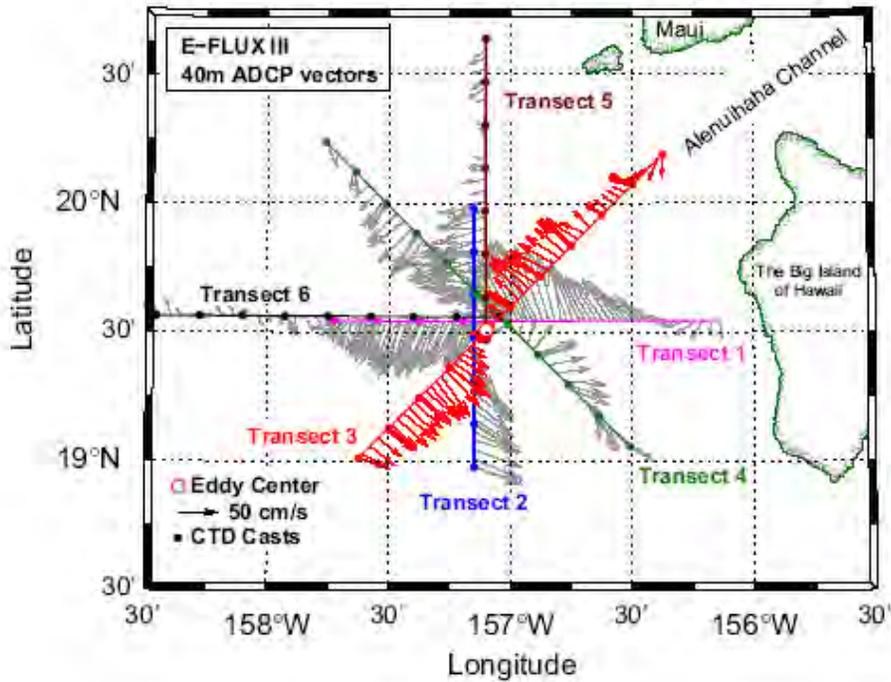


Figure 6. Currents measured at 40 m depth during E-Flux III cruise, March 10-27, 2005.

Vertical sections of currents along two of the transects shown in Figure 4 reveal the surface intensification of the flows in the eddy that was sampled (Figure 7), resulting in strong vertical shear of the horizontal flow. The vertical shears and horizontal shears are shown in Figure 8.

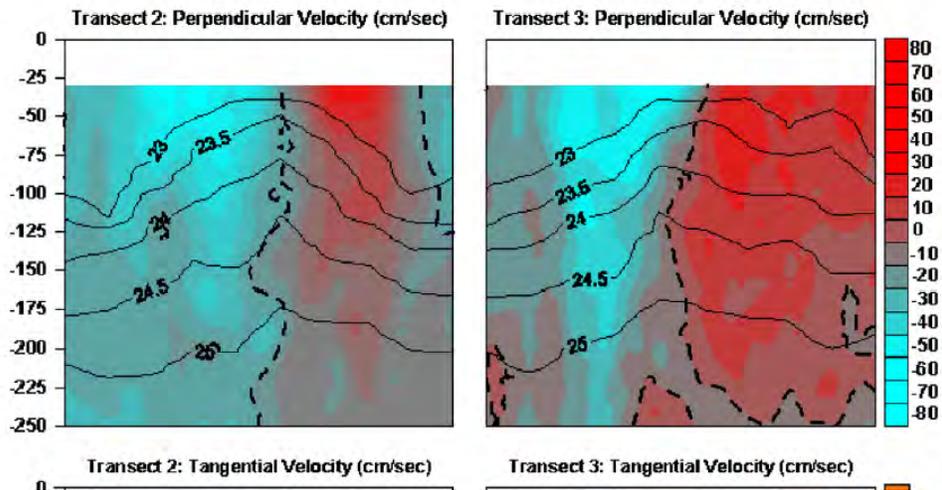


Figure 7. Shipboard ADCP measurements of currents across transects 2 and 3 during E-Flux I. Red (blue) indicates flow into (out of) the section. This black lines are the potential density contours. Note the strong flows and the increase of velocity towards the surface. After Nencioli et al. (2008).

transect. Lack of data at the end of transect 4 is due to instrument failure.

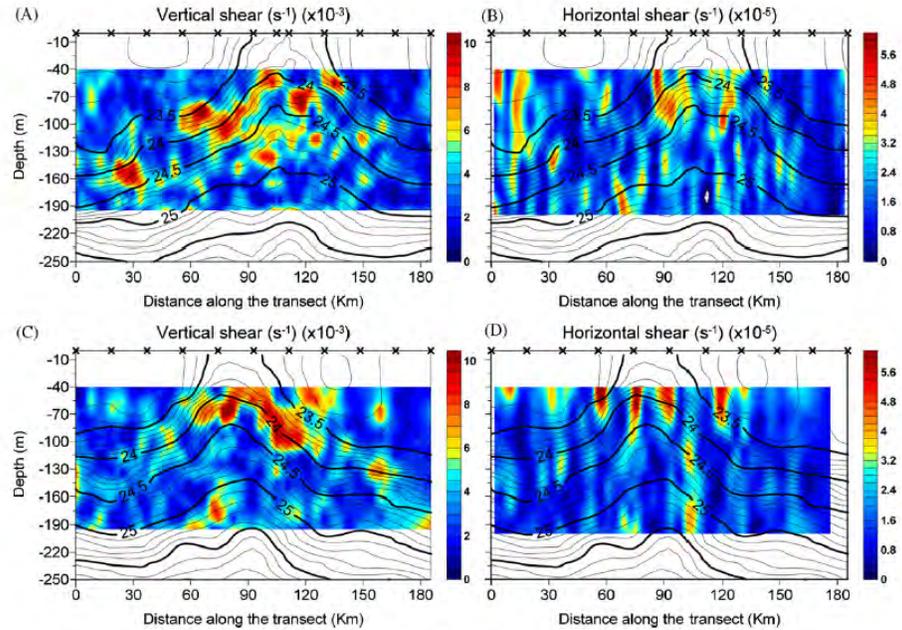


Figure 8. Vertical sections of vertical and horizontal velocity shear for Transects 3 and 4. Black lines are contours of density showing the strong upwelling in this cyclonic eddy. After Nencioli et al. (2008).

Surface drifter measurements

Satellite-tracked surface drifter measurements in Hawaiian waters have been analyzed by Lumpkin and Flament (2001), showing that region in the lee of the Hawaiian Islands has relatively large surface current variability, with the root-mean-square (RMS) zonal and meridional components ~ 15 cm/s, which is large than the magnitude of the time-averaged flow. As discussed above, the eddy field dominates the currents.

Surface drifters tracked during the E-Flux I experiment showed that flow around mesoscale eddies is strong and nearly circular, accounting for the motion of the eddies. The two drifters in Figure 9 show opposite rotation directions, indicating that an anticyclonic eddy-cyclonic eddy pair were affecting the region. More importantly, the crossing drifter trajectories is an indication of the exchange of waters between these features. In other words, the flows are diffusive.

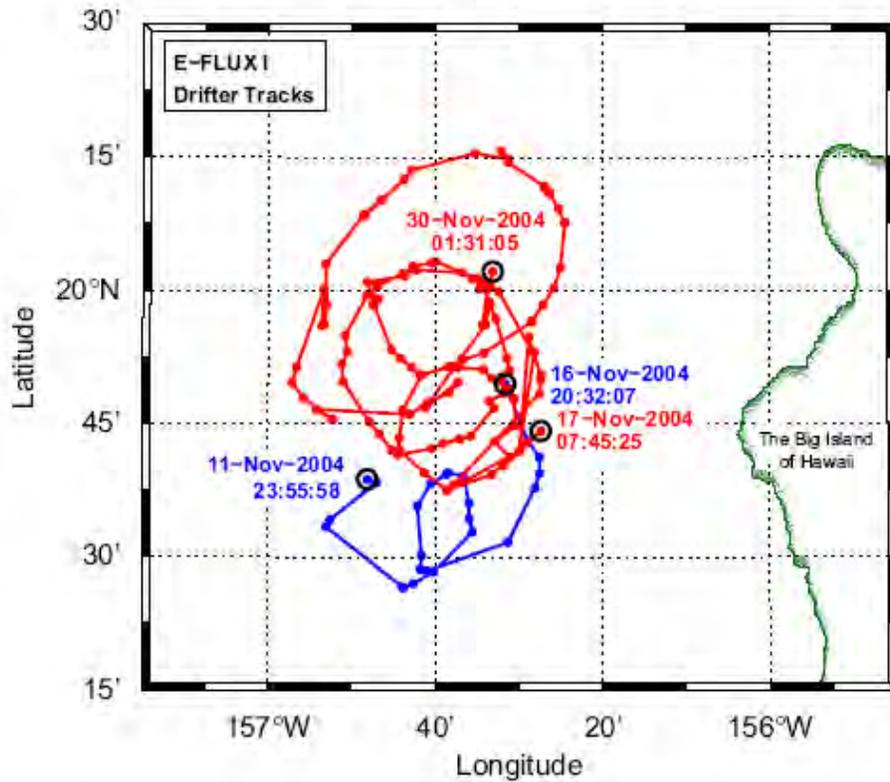


Figure 9. Drifter trajectories during E-Flux I.

Dynamic data assimilation

The U.S. Navy uses the Hybrid Coordinate Ocean Model (HyCOM; Hurlburt et al., 2008) to assimilate satellite and in situ observations to produce daily analyses of the global ocean at high resolution. These can be found at <http://www7320.nrlssc.navy.mil/GLBhycom1-12/hawaii.html> including animations for the past 30 days and one year. These analyses fully resolve the mesoscale, and even submesoscale eddies.

Surface salinity analyzed in the study region (Figure 10) is a good tracer for the region west of Hawaii Island, revealing the presence of a spectrum of eddying motions, dominated by the mesoscale, the scale at which energy is generally introduced to the eddy field. Energy flows to smaller horizontal scales, where it enhances vertical mixing through the vertical shear and strain of the eddies.

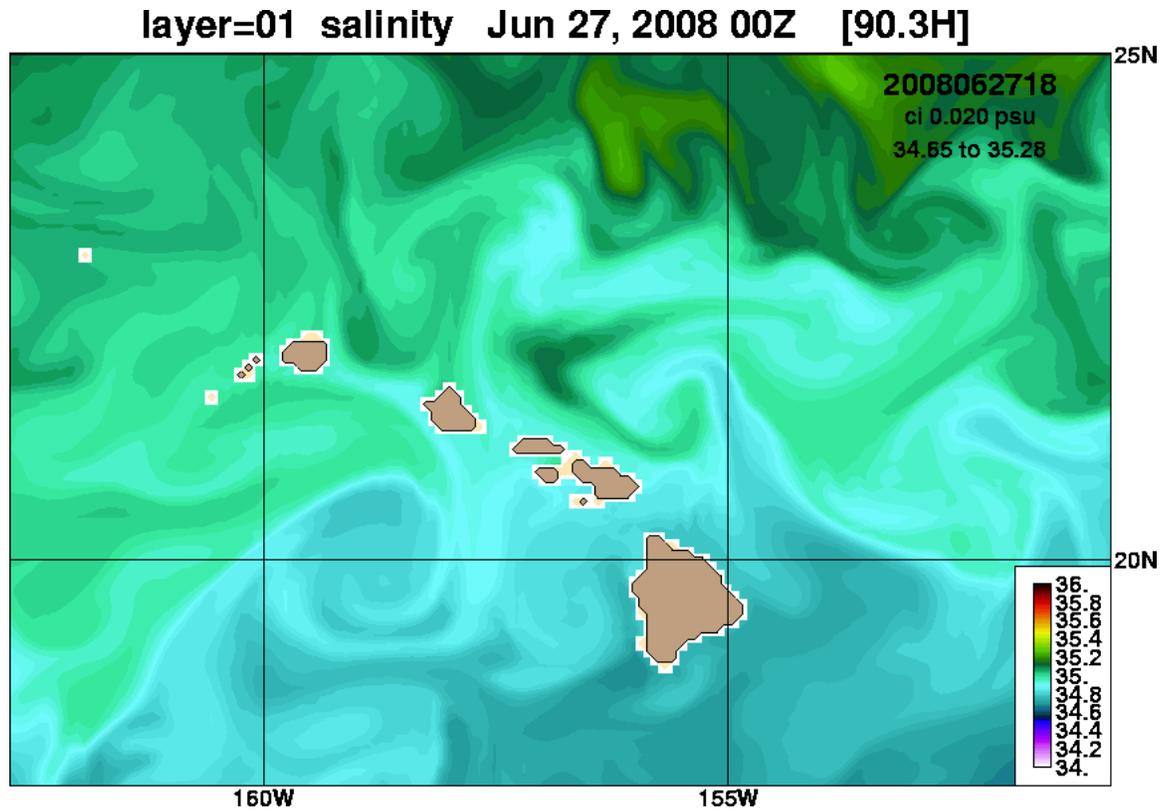


Figure 10. Snapshot of analyzed surface salinity field around the Hawaiian Islands for June 27, 2008. Note the spiral features which are associated with the circulation in eddies. Animations of these analyses reveal the rich space-time structure of the flows in this region.

ADVECTIVE-DIFFUSIVE BALANCE

The basic conservation equation for the concentration of material C following a water parcel is

$$dC/dt = \text{source} - \text{sink} - \text{mixing}$$

assuming that C is neutrally buoyant. (If C is denser than the seawater parcel, it will sink to greater depths, which will only enhance dispersion.)

The source for C within the water parcel is zero after it passes through the aquaculture cage. A model for the source (initial concentration) within the cage is required. This is related to the rate of flow through the cage and the rate of production of C.

The sink for C within the water parcel is due to consumption (e.g grazing by zooplankton, uptake by phytoplankton) and possibly photochemical reactions.

Mixing has vertical and horizontal components, with the horizontal component dominating, though the vertical component is also important. The challenge is to model the mixing processes appropriately and to estimate the corresponding parameters.

Then the conservation equation for C can be solved along water parcel trajectories. These are determined by the details of the space and time structure of the flow field, which may be highly variable, generally requiring a very sophisticated numerical model to simulate and predict, such as the HyCOM.

DIFFUSION ESTIMATES

Lumpkin and Flament (2001) analyzed the surface drifter database to produce maps of the spatial distribution of mean currents and their variability. In addition, they extracted Lagrangian integral scales (Table 1).

	Time scale (days)	Length scale (km)	Eddy diffusion (x 10³ m²/s)
Zonal component	4.8	58	9.6
Meridional component	4.0	53	7.3

Eden and Greatbatch (2008) have shown how the vertical shear in mesoscale eddies enhances diapycnal mixing. Thus, in addition to the along-isopycnal dispersion that is caused by the eddy field in the lee of Hawaii, properties are mixed across isopycnals, vertically spreading water properties.

CONCLUSIONS

The proposed site has weak mean flows, and is subject to frequent strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence

for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii. Thus, they are more dispersive.

Strong vertical shears are usually found in these eddies, causing strong vertical mixing. This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal location to minimize accumulation of by-waste products.

Should an accumulation of by-waste occur, it will very likely be dispersed within a few days. But, it will also be consumed by phytoplankton and zooplankton.

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APPENDIX C
CULTURAL IMPACT ASSESSMENT

Hawai‘i Oceanic Technology
Proposed Ahi Aquaculture Farm
North Kohala Ocean Lease Site

Cultural Impact Assessment

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December 24, 2008

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1.0 Methods and Procedures

This section presents a discussion of the methods applied to identify and interview individuals and organizations identified who are familiar with cultural practices and features associated with the project area.

This cultural impact assessment study was done 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. The author first identified those people who are familiar with the cultural practices and features associated with the project area, based on his twenty year experience in local land and ocean use issues, and consultations with local community leaders.

With each individual or group, the interview process was to thank them for their time and present them with a brief description of the project and that the company is preparing a Cultural Impact Assessment on the potential impact of the project on cultural resources and practices in the project site and surrounding area as part of the Environmental Impact Statement.

After this introduction, the interviewer would first ask permission to record the session and take notes on the conversation. Then he would ask the individuals for 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. Then, he would ask the interviewee's perspective on the potential impact on cultural resources, practices, values of the proposed project. And finally, at each meeting with an individual, the interviewer would ask if there is someone else to consult about this land or ocean. The interviewer would receive suggestions and follow up with these individuals for an interview or consultation. Notes and transcripts for each meeting were prepared and returned to interviewees for review, correction and release.

The series of interviews began with a kupuna who is recognized widely as the person to consult on any ocean related matter in the Kawaihae area, William Akau. He is the former Harbor Master for Kawaihae and lives there today. Mr. Akau was born in Kawaihae, and is the eldest member of the 5th generation native Hawaiian family from the Kawaihae area, with ancestral ties to Kawaihae Uka, just mauka of the village. In the interview, Mr. Akau said that the area on the shoreline closest to the ocean lease site is the Pu'u Ulaula area, between Waiakailio Bay and Black Point (Malae Point). He said this whole area has been under ranching for generations in Kahuā Ranch. Mr. Akau recommended to talk with the owner of Kahuā Ranch, Monty Richards. He also recommended to talk with Pono Von Holt, the owner of Ponoholo Ranch that has the lease now. On the ocean user side, Mr. Akau recommended to talk with Lala La'au about 'ōpelu fishing, and to one of the long-time trollers and bottomfishermen from Kohala. The meeting was at his home in Kawaihae on June 18, 2008. Transcript of this meeting was prepared from an electronic recording. The transcript was reviewed and approved on December 19, 2008, and is in Appendix B.

Monty Richards talked with the author on June 17, 2008, who agreed that Kahua probably was the entity responsible for the stewardship of the land and ahupua'a in this area. He said they had the lease on over four thousand acres of state land there with the Pahinahina lease for generations. Kahuā owned the makai lands of Ki'iokalani and Puaiki ahupua'a, located at Malae Point. Monty said that the Pahinahina lease and the Ki'iokalani parcel were transferred to Pono Holo Ranch in an amicable separation into two ranches of Kahuā Ranch and Ponoholo Ranch in 1989. Mr. Richards recommended to go talk to Mr.

Von Holt. At the author's request, Mr. Richards agreed to do an oral history interview later. He said he'd also think about anyone else to consult.

Pono and Angie Von Holt met with the author on June 17, 2008, and they gave the background history they knew and recommended to talk with the Ho'opai family, who is the Native Hawaiian paniolo family who has been working for Kahuā since 1928, and regularly uses Ki'iokalani, the coastal area located at Malae Point, the land closest to the ocean lease site. The meeting took place at the Ponoholo Ranch headquarters, Kohala. A voice recorder was not used for this consultation and the transcript was reconstructed from notes taken by the author during the meeting. The transcript was prepared, reviewed and approved on September 17, 2008, and is in Appendix B.

Three members of the Ho'opai family met with the author on June 28, 2008, including Kimo, Leina'ala, and Bernard Ho'opai. They spoke about their stories of cultural practices, resources and values associated with this area. The interview took place at the Ho'opai family home. It was not recorded because the electronic recorder malfunctioned. The transcript was reconstructed from notes taken by the author during the interview. The transcript was prepared, reviewed, revised and approved on October 7 and 9, 2008, and is in Appendix B.

Monty Richards was interviewed by the author at the Kahuā Ranch headquarters on June 30, 2008 and recorded an oral history interview concentrating on stories of this region in particular. A transcript was prepared and reviewed and approved on December 17, 2008, and is in Appendix B.

After consultations with William Akau, the Ho'opai family and Sara Peck (UH West Hawaii Sea Grant Extension Agent) and some Kawaihae-based recreational trollers, three long time fishers were identified and selected for interviews, two who primarily target 'ōpelu along the shoreline between Kawaihae and Mahukona: Lala La'au and Robert Cambra; and one fisherman who targets bottomfish and trolls in the ocean off the Kohala coast: Kwanji Fukuyama.

Eddie Lala La'au is recognized as the kupuna 'ōpelu fisherman of the area. His father was an 'ōpelu fisherman before him, active in the 1940s and afterward. Lala was interviewed on July 3, 2008 at the Kawaihae Fish Market, now owned by his daughter. The interview was recorded and a transcript was prepared. The final transcript was prepared, reviewed and approved on September 17, 2008, and is in Appendix B.

Kwanji Fukuyama is recognized as a long time bottom fisherman. When in season, he targets onaga, opakapaka, ehu and the other four of the seven bottom fish species. Kwanji also trolls for ono and mahimahi. He was interviewed at his home in Hawi on August 19, 2008. The interview was recorded and a transcript was prepared. A transcript was prepared, reviewed, revised and approved on September 9, 2008, and is in Appendix B.

Robert Cambra, Sr. is a long time 'ōpelu fisherman, who had previously fished for bottomfish. His father-in-law was Takeo Yamasaki, who started fishing about 50 years ago and fished actively until about 20 years ago. Robert fished with his father-in-law for many years. He fished for 'ōpelu, weke, uku, trolled for mahi and ono, and sometimes bottom fish. He was consulted at his home in Hawi on August 19, 2008, and again on December 22, 2008, and provided extensive information on bottomfishing that is included in this report.

2.0 Biographical information on individuals consulted

This section presents the biographic information concerning the individuals consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge, and cultural expertise, if any, and the historical and genealogical relations to the project area.

William Akau was the first contacted. He is the eldest member of the Akau family, which goes back for five generations in Kawaihae, with ancestral ties to Kawaihae Uka. William is the former harbor master of Kawaihae, and recognized as the Native Hawaiian kupuna and konohiki of anything to do with the ocean in the Kawaihae area.

Monty Richards, owner of Kahuā Ranch, was identified by Mr. Akau as the eldest konohiki of this area of ocean since Kahuā Ranch owned and leased all the land in this region for generations. Monty is the past president of Kahua Ranch, having turned management of the ranch to his son, Tim. Monty Richards is the son of Herbert Montague “Monty” Richards, and nephew of Atherton Richards, who co-founded Kahuā Ranch in 1928 with Ronald Von Holt. They were grandsons of William Richards, an early missionary pioneer in Hawaii.

Pono Von Holt, owner of Ponoholo Ranch is the son of Ronald Von Holt, co-founder of Kahuā Ranch in 1928 with Atherton Richards. Ronald is the grandson of Hermann von Holt from Hamburg, who arrived in Hawaii in 1851 and established a successful store on Oahu. William Akau recognized Pono von Holt as a konohiki of the region, especially since Pono Holo Ranch runs the ranch in the Pu‘u Ulaula region, including the 4,000 acre Pahinahina lease from the State of Hawaii, and owns the shoreline parcel of the Ki‘iokalani ahupua`a. Pono and his wife, Angie provided an interview and were consulted.

Kimo Ho‘opai was born at Kahuā in 1937. His father, Clement Ho‘opai started working at Kahuā in 1929 in the early days of Kahuā. His mother was Lily Likelike, born in Hawi. Kimo Ho‘opai is recognized as the last of the old-time paniolo of this area. Kimo’s wife, Leina‘ala also was born at Kahuā to her father Charles Akina and mother Rose Pe‘ahi Akina. Her father started working at Kahuā in 1928 when the Ranch was formed. Their son Bernard Ho‘opai also works for Kahuā. With Bernard’s grandchildren carrying on the paniolo tradition, the Ho‘opai family is a fifth generation Native Hawaiian paniolo family working for Kahuā Ranch.

Kimo, Leina‘ala and Bernard Ho‘opai and their ohana are recognized as Native Hawaiian cultural practitioners for their continuous use of Ki‘iokalani for generations, for their lifestyle of camping, fishing, and gathering on the shoreline and coastal waters. This family carries on the stories of native Hawaiian history, cultural values and traditions to the next generations. As a family, they provided an oral history interview.

Michael Hanohano is President of the nonprofit cultural group, Ka‘ike o Ka‘Aina, which is the lessee of Puanui makai parcel from the landowner Kamehameha Schools - Bishop Estate. Michael is also the great grandnephew of William Pitt Leleiohoku, the original Land Commission Awardee for Puanui ahupua‘a, just north of Malae Point. William Pitt Leleiohoku was a prince of the Kingdom of Hawaii and member of the reigning House of Kalakaua. Mr. Hanohano was consulted about the project.

Eddie “Lala” La‘au is recognized as the kupuna ‘ōpelu fisherman in the Kawaihae area. He was born here, and his father and grandfather also fished these waters before him. He is a Native Hawaiian

cultural practitioner and provided an oral history interview. Mr. La‘au was interviewed at the Kawaihae Fish Market, now owned by his daughter.

Kwanji Fukuyama, who is 85 years old, is a long time bottom fisherman, who has fished the waters between Puako and Mahukona for years. Mr. Fukuyama was born in Hoesa camp, near Hawi, on May 17, 1923 to Ataro and Shizue Fukuyama, both of whom had immigrated from Japan. When in season, Mr. Fukuyama targets onaga, opakapaka, ehu and the other four of the seven bottom fish species. He also trolls for ono and mahimahi. His son is Peter, who is also a fisherman. Mr. Fukuyama provided an oral history interview, with follow up written comments.

Robert Cambra, Sr., was born in Hawi in 1938. His father was Arthur Cambra, born in Hawi in 1911. His grandfather immigrated to Hawai‘i from Portugal. Robert Cambra is a long time ‘ōpelu fisherman in this area between Kawaihae and Mahukona. He had previously fished for bottomfish in the same area. His father-in-law was Takeo Yamasaki, who started fishing about 50-60 years ago and fished actively until about 20 years ago. Mr. Cambra fished with his father-in-law for many years. He fished for ‘ōpelu, weke, uku, trolled for mahi and ono, and sometimes bottom fish. Mr. Cambra generously provided several consultations in person and over the phone.

3.0 Historical and Cultural Source Materials Consulted

The individuals who have a historical association with the ocean in the ocean lease area provided very important information on the cultural resources and activities in the area. William Akau is a native Hawaiian who is the eldest in a fifth generation family from the Kawaihae area, and who served as the local harbor master for many years. Lala La`au is a native Hawaiian whose ancestors are from the Puako and Kona area, and who has fished for `ōpelu between Kawaihae and Mahukona like his father and grandfather before him. Kwanji Fukuyama is the 85-year old son of Japanese immigrants, born at Haena, near Hawi, who has fished this area throughout his life. Robert Cambra, born sixty years ago in Kohala, is the great grandson of a Portuguese immigrant to Kohala and has fished this area throughout his life, sometimes with his father-in-law Mr. Yamasaki, who fished this area before him, starting 50 years ago.

The individuals who have an historical association with the adjacent coastal lands provided additional important information on the cultural resources and activities in the general area including nearshore waters and the coastal lands. Monty Richards runs Kahuā Ranch and is a kama`āina whose great grandfather was a missionary pioneer in Hawaii, and whose father and uncle co-founded Kahuā Ranch eighty years ago on the adjacent coastal lands. Pono von Holt runs PonoHolo Ranch and is kama`āina whose great grandfather emigrated to Hawaii from Germany, and whose father co-founded the ranch eighty years ago on the adjacent coastal lands. The Ho`opai family are a native Hawaiian family who have lived and worked on the adjacent coastal ranch lands for over eighty years.

In addition to the interviews and consultations with these individuals, the author researched historical documents in person at the Hawai`i State Public Library System's two branches in the Kohala area: the Thelma Parker Memorial Library in Waimea (Kamuela), South Kohala and the Bond Memorial Library in Kapa`au, North Kohala. The Bond Memorial Library had a complete report from the *North Kohala Coastal Cultural Resource and Heritage Landscape Study* done in 2005 by University of Hawaii Department of Urban and Regional Planning under Dr. Luciano Minerbi, which provided a wealth of information about the region. The author also researched the Hawaiian collection of books and historical maps at the University of Hawai`i at Hilo Mo`okini Library, researched records on Royal Patents and Land Court Awards at the Hawai`i State Department of Land and Natural Resources, Bureau of Conveyances, researched title history in the Hawaii County Planning Department records, and researched Hawaiian language newspapers through the Hawaiian Nupepa Collection at the Bishop Museum on-line library.

A bibliography of all the documents used in the research is included below. While the author is not able to read Hawaiian language and translate it into English, this limitation did not have a material effect on the historical research because the author obtained English translations of relevant Hawaiian language documents, especially using the documents collected in the *North Kohala Coastal Cultural Resource and Heritage Landscape Study* done in 2005 by University of Hawaii Department of Urban and Regional Planning. This comprehensive collection fills several boxes at the Bond Memorial library and is accessible to the public as reference documents. This study included English translations of Royal Patents, Land Court Awards and Boundary Review Commission testimony regarding lands in Kohala. In addition, there was research done by Kepa Maly for the UH DURP study on the Coastal Resources and Cultural Landscape of North Kohala, on the moolelo about the Kohala coastal region. This research included an English translation of *He Moolelo no Makalei*, published in 1928 in *Ka Hoku O Hawaii*, and stories about *Kohala Waho* (leeward Kohala). English translations of early newspaper articles written in Hawaiian available at the Hawaiian Nupepa Collection on line also provided additional information for research purposes.

Figure 1: Listing of Previous historic and archeological research

<p><i>Previous research about the proposed ocean lease site:</i></p> <ul style="list-style-type: none"> • No documented historical or archeological research has been conducted specifically at the proposed ocean lease site.
<p><i>Previous research about the ocean waters in the general area between Kawaihae and Mahukona:</i></p> <ul style="list-style-type: none"> • Akau 1998 interview in Maly 2003 • La'au 2004 interview in Pacific Worlds, 2004 • Ellis 1963 • Newman 1968 • Bonk 1968 • DURP 2005
<p><i>Previous research about the native Hawaiian cultural use of the ocean, in general</i></p> <ul style="list-style-type: none"> • Newman 1968 • Shon 1985 • Murakami, 1991 • Meller, 1985 • Maly, 2003 • Manu 1992 • MacKenzie (Ed), 1991 • Kosaki 1954 • Iverson, et al 1990 • Jordan and Evermann, 1902 • Cobb 1968 • Campbell 1967
<p><i>Previous Research about the coastal area adjacent to the proposed lease site:</i></p> <ul style="list-style-type: none"> • Bergin 2004 • Bonk 1968 • Cahill 1999 • Clark 1986 • Damon 1950 • UH-DURP 2005 • Ellis 1968 • Kirch 1994 • Maly 2005 • National Park Service Ala Kahakai National Historic Trail, 2007 • Newman 1968 • Newman 1970 • Pearson 1968 • Schilt and Sinoto 1980 • Soehren 1969 • Schweitzer 2003 • Tomonari-Tuggle 1973 • Tomonari-Tuggle 1988 • Tuggle and Griffin 1973
<p><i>Previous Research about Hawaiian culture in general</i></p> <ul style="list-style-type: none"> • Dorrance and Morgan 2000 • Fornander 1996 • Kamakau 1992 • Kolb 1991 • Kuykendall 1968 • Malo 1951 • Tomonari-Tuggle 2002

(Please see bibliography for further information)

Figure 2: "Section of Pili Lands, Surveyed for the Waimea G. &A. Co. February 1862, Sam. C. Wiltse, Surveyor

Section of
PILI-LANDS
 Surveyed for The Waimea G. & A. Co.
 Feb. 1862
 Sam. C. Wiltse Sur.

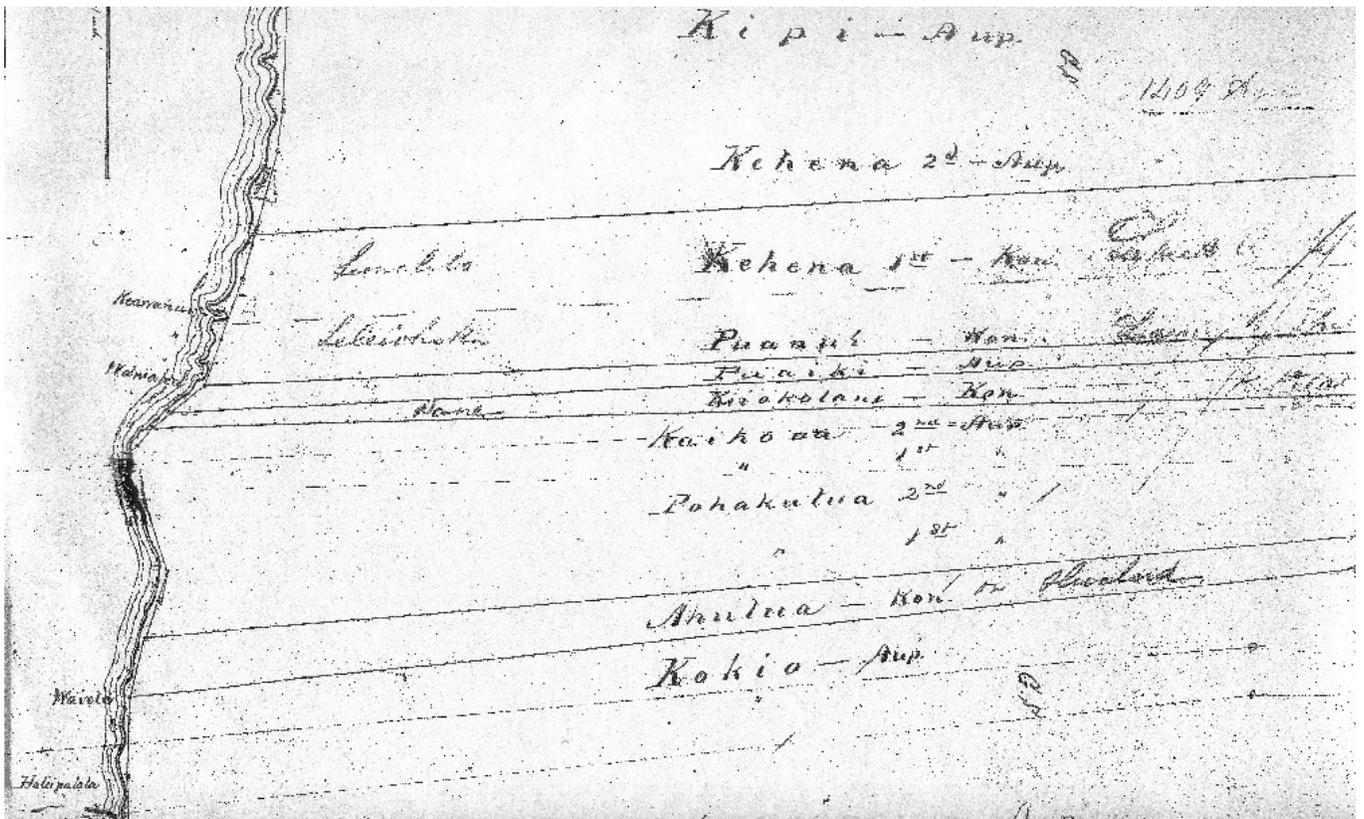


Figure 3: Map from Bonk (1968) of archeology studies on Kohala coastal lands

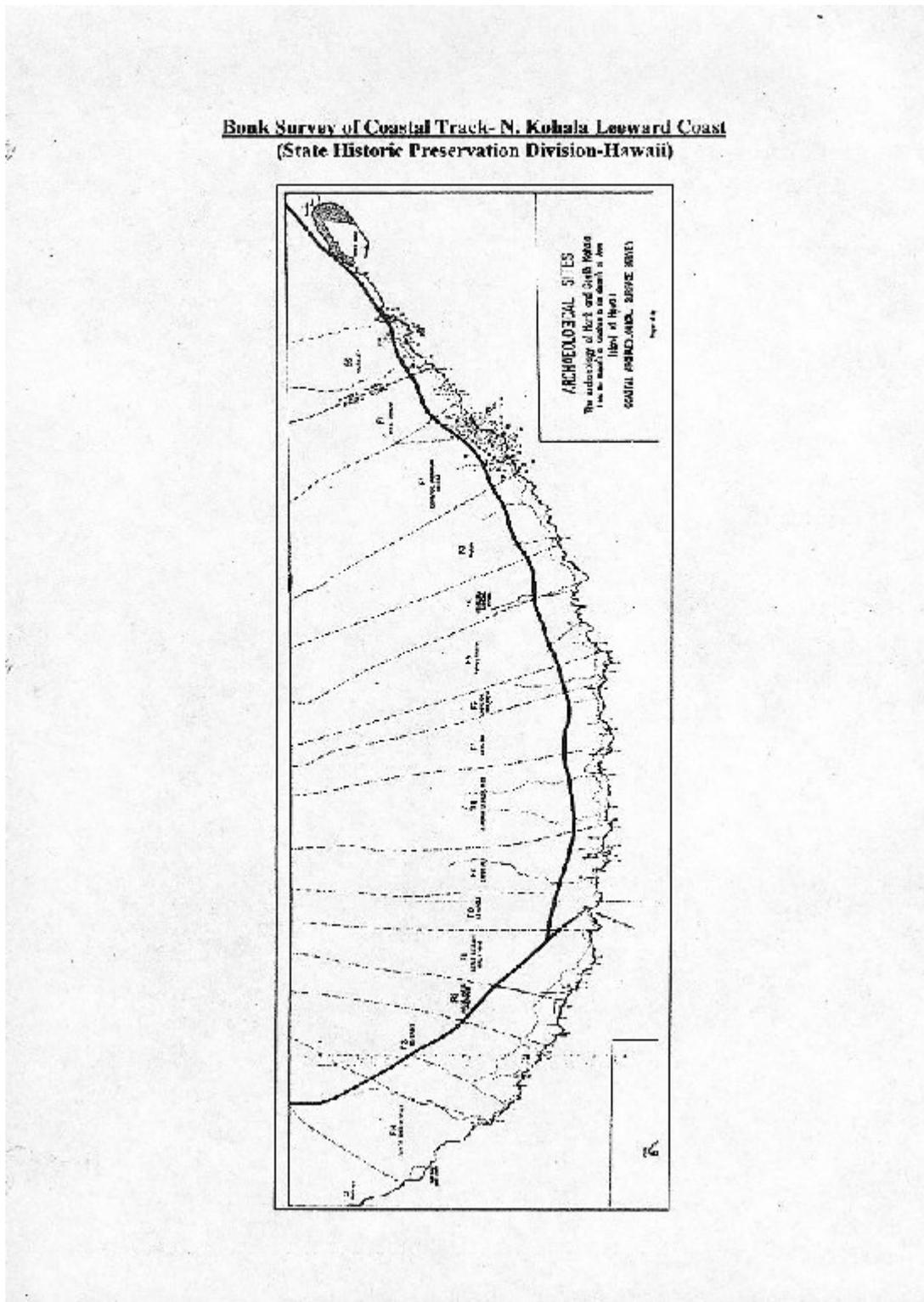
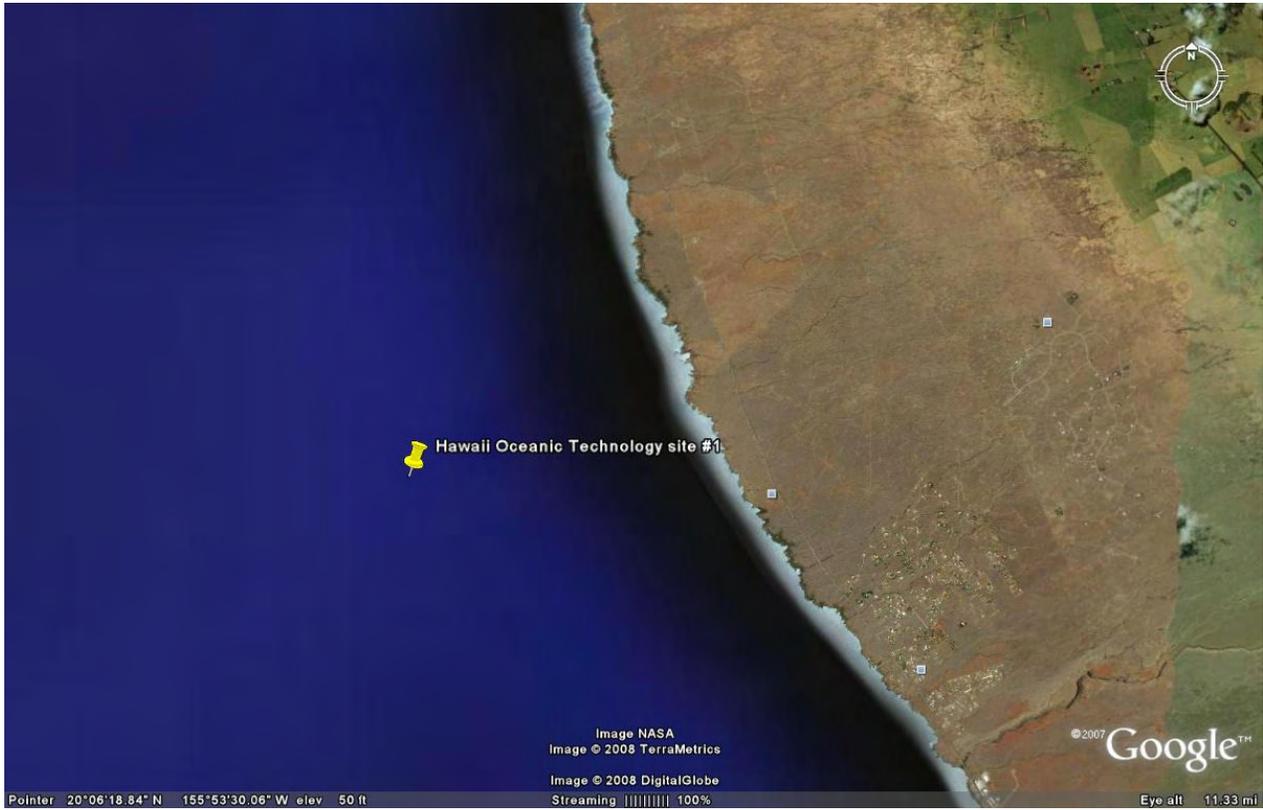


Figure 4: Two Aerial Views of Ocean Lease Site



4.0 Cultural Resources, Practices and Beliefs Identified

This section includes a discussion concerning the cultural resources, practices and beliefs identified, and the location of resources and practices within the broad geographical area in which the proposed action is located, as well as the direct or indirect significance or connection of resources and practices to the project site.

First an historical background of the cultural practices of fishing and konohiki management is presented. Then, an analysis is presented of the cultural resources in the Region of Influence, in the ocean area surrounding the proposed ocean lease site, and in the coastal land area adjacent to the proposed ocean lease site.

4.1 Regulatory Framework for identifying native Hawaiian resources:

Native Hawaiian resources consist of properties of traditional religious and cultural importance to a Native Hawaiian group. These can include traditional cultural places or properties, prehistoric or historical archeological sites, such as heiau, burial sites, houses, gathering sites, work sites, special use sites, and plants and animals used for subsistence and other purposes.

A traditional cultural property (TCP) is defined in the U.S. National Park Service in 1990 as “generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history, and (b) are important in maintaining the continuing cultural identity of the community.” (Parker and King 1998)

There are also sites that are not eligible for inclusion on the National Register of Historic Places but may be still considered areas of traditional importance (ATI) because they are rooted in the community’s history and are important to maintaining cultural identity.

4.2 Native Hawaiian Culture and the Ocean

The ocean was deeply woven on a day to day basis with the life of Hawaiians throughout their history. The ocean is rich in cultural significance as embodiments of gods and goddesses, as well as the home of personal gods, or ‘aumākua. Maly (2004) states:

In Hawaiian culture, natural and cultural resources are one and the same. Native traditions describe the formation (literally the birth) of the Hawaiian Islands and the presence of life on, and around them, in the context of genealogical accounts. All forms of the natural environment, from the skies and mountain peaks, to the watered valleys and lava plains, and to the shoreline and ocean depths are believed to be embodiments of Hawaiian gods and deities. One Hawaiian genealogical account records that Wakea (the expanse of the sky – father) and Papa-hanau-moku (Papa, who gave birth to the islands) – also called Haumea-nui-hanau-wawa (Great Haumea, born time and time again) – and various gods and creative forces of nature, gave birth to the islands. Hawaii, the largest of the islands, was the first born of these island children. As the Hawaiian genealogical account continues, we find that these same god-beings, or creative forces of nature who gave birth to the islands, were also the parents of the first man (Haloa), and from this ancestor all Hawaiian people are descended (David Malo, 1951; Beckwith, 1970; Pukui and Korn, 1973). It was in this context of kinship that the ancient Hawaiian

addressed their environment, and it is the basis of the Hawaiian system of land use. (Maly 2004: 5).

Traditional and customary practices of the ocean include many types of fishing, which were used for trolling, net fishing for 'ōpelu, bottom fishing, as well as thrownet, fishtraps and harpoon fishing from shore. Traditional use of coastal resources along the shoreline and intertidal areas also includes gathering of wana, 'opihi, and various limu for consumption. Konohiki were those given the authority to manage the resource use in the ahupua'a, establishing boundaries, kapu seasons, to ensure good harvests for ahupua'a tenants, and the local chief.

4.3 Fishing

Among the literature cited above, the one document which provides a comprehensive resource on the history of fisheries in Hawaii is Kepa and Onaona Maly's comprehensive work, *Ka Hana Lawai'a A Me Na Ko'a O Na Kai 'Ewalu, A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands* prepared for the Nature Conservancy in 2003. This document compiles information on the history of fishing practices and marine fisheries of the Hawaiian Islands from Native Hawaiian traditions, historical accounts, government communications, kama'āina testimony and ethnography. For a detailed analysis on the topic, the reader is referred to this resource for study.

For an historic analysis of fisheries in the Kohala area or Hawaii island, the reader is referred to T. Stell Newman's 1968 report on early fishing and farming on Hawai'i Island in 1778 (Newman, 1968). It is from this document, that the general description of historical fisheries in Hawaii is obtained, as well as some information on the fisheries and settlement patterns in this particular area of Hawaii.

To describe the nature of fisheries in Hawaii, Newman (1968) describes the basic geography of the ocean waters in the following manner:

Data presented in Chapter III indicate that the maximum depth to which the Hawaiians were able to fish was 1,200 feet (350 meters) below the surface; the water area of the Hawaiian Islands of depths less than this figure is extremely limited. An example of this may be seen in Map 14 where the 1,200 foot (350 meter) underwater contour is plotted for Hawaii Island. There are only about 500 square miles (800 square kilometers) of inshore waters surrounding Hawaii Island less than 600 feet (200 meters) in depth (Bryan 1954:4). If the slope from the 600 feet to the 1,200 foot contour is about the same as from 0 to 600 feet the maximum ocean area usable for sub-surface angling around Hawaii Island is roughly 1,000 square miles (1,600 square kilometers). The actual area exploited by native fishermen would undoubtedly have been greatly less because of bottom conditions, water currents, swell systems, and inadequate habitat conditions to support the types of marine life normally exploited by the Hawaiians. (Newman, 1968: 11-12)

Newman described the marine biota as follows:

the effect of this geological feature on the marine biota is seen in the division of the waters surrounding the Hawaiian Islands into three basic habitat types: the pelagic, benthic, and inshore or reef area, each with its characteristic fauna. The pelagic habitat, quite uniform in temperature and salinity, ranges from the surface to perhaps 600 feet (200 meters) in depth and is located in the open sea offshore from the Islands (Gosline and Brock 1965: 6). Comparatively few species of fish are found in the pelagic

habitat and those exploited by the Hawaiian were surface feeding carnivores such as malolo, 'ahi, aku, ono, mahimahi, and kaku. There is also an inshore pelagic (neritic) zone, defined by Gosline and Brock (1965:7) as the upper water layers where the total depth is less than 600 feet (200 meters) in depth. In this subzone are often found the usual pelagic species as well as others restricted to this zone, such as the akule, 'ōpelu and kawakawa.

The benthic, or bottom habitat, is the sea floor at depths from 180 to 900 feet (50 to 300 meters) in which the fish fauna is only poorly known (Gosline and Brock 1965:7).

The inshore or reef habitat extends from the above surface splash and surge pools to a depth of about 180 feet (50 meters) (Gosline and Brock 1965:5). As noted above, this area is quite limited in extent in the Hawaiian Islands because of the steepness of the underwater base. Only in embayed areas such as Kaneohe Bay on Oahu does the horizontal extent of the zone exceed one-half mile (0.8 kilometers). The largest marine biomass (total living weight) is found in this inshore habitat and it was the habitat most extensively exploited by Hawaiians, as will be shown in Chapter III. (Newman, 1968: 12).

Specifically relating to the predominance of fishing on the leeward side of Hawaii Island, Newman notes that:

Historical studies also show that most fishing tended to take place along the leeward coastlines although this may have also been due, in part, to the difficulties of fishing the inshore waters of the windward shores. For example little fishing was described by Ellis (1963) for the windward coastline of Hawaii Island in 1823 although fishing was very important in leeward areas. (Newman, 1968: 15).

In looking at the information for the late eighteenth century, Newman notes that “Careful research through the journals of Cook, Clerke, King, Anderson, Samwell, Burney, Williamson, and Edgar, however, yielded only scant materials on sea exploitation. (Newman, 1968: 52).

Early nineteenth century fishing techniques were described in the diary of Archibald Campbell, who observed fishing by net, hook and line and poisoning during his stay on Oahu during 1809 and 1810. Campbell notes that the hooks were made of pearl or turtle shell and that iron trade fishhooks were coming into general use. “The only type of hook and line fishing mentioned was trolling with the pā type lure for aku, 'ahi and mahimahi. Campbell noted that the fish lines were made of olona, spun into lines by rolling the fibers between the hand and thigh.” (Newman, 1968: 50).

Newman (1968) recounts John Papa Ii's description of early nineteenth century fishing in Hawaii. Ii was born in 1800 “...and served in the Kamehameha I household under Liholiho, the son of Kamehameha I. He describes this account:

Kamehameha was often seen fishing with his fishermen in the deep ocean, where the sea was shallow, and where fish-poison plants were used. He took care of the canoe paddlers who went out for aku fish, bringing in supplies from the other islands for them and sent ships to and fro fetching nets, lines, olona fibers and other things (p. 69 – Ii in Newman, p. 51)

Kamakau, who was born in 1815, and was a native historian about the earlier period of the life of Kamehameha I. He described fishing techniques during this early nineteenth century period as:

There were deep sea nets for fishing (aumaiewa), shallow sea nets for fishing (laulele), nets for fishing by diving ('upena-lu'u), fishing by enticing into the net by means of a stick with a strong odor (lawai'a melomelo), aku trolling with mother-of-pearl hooks (lawai'a-a-hi-aku), ahi trolling with hook and line (hi-'ahi), net fishing from flying fish (hano-malolo), trolling for kahala fish with hook and line (hi-kahala), and several other kinds. (p. 176 Kamakau in Newman, p. 51)

Malo, Ii, and Kamakau "...tend to substantiate one another and depict the use of seine /bag net combinations, bag nets used alone, melomelo bait sticks, fish poisoning, handheld diver's nets, trolling for aku with the pā lure as well as hook and line fishing for 'ahi and kahala" (Newman, p. 51).

The quantitative data from John Cobb for the Hawaii Island 1900 commercial fishery are summarized here:

Figure 5 Hawaii Island Commercial Catch : 1900

Technique	Poundage	Percent
Hook and line	995,952	78.3
Seine/Bag nets	65,893	5.1
Gill nets	60,042	4.7
Cast nets	49,852	3.9
Bag Nets only	49,000	3.8
Basket Traps	4,737	.3
Snares	600	.04
Spears	18,246	1.4
Hands	26,579	2.0
TOTAL	1,270,901	100 (rounded)

(Cobb 1902 in Newman, 1968: 42)

Newman (1968) notes that

Middle nineteenth century sea exploitation has been well and authoritatively described by A.D. Kahaulelio in the Hawaiian-language newspaper, Ka Nupepa Ku'oko'a . These articles have since been translated by Mary Pukui and the translation manuscript is to be found in the Bishop Museum Library (Kahaulelio, 1902)...It will be seen that many of the techniques described by Beckley and Cobb from the late nineteenth century are also described by Kahaulelio for this earlier period. (Newman, 1968: 42-43).

The techniques described by Kahaulelio included spearing, hand collection, basket traps, nets and hook and line. Spearing, hand collection and basket traps "were described by Kahaulelio in terms quite similar to those of the late nineteenth century authors, making it certain that the same general techniques were in use throughout these two time periods." (Newman, 1968: 43)

4.4 Brief general history of konohiki rights and the ahupua‘a

Konohiki fishing rights were part of the ancient Hawaiian system of land and ocean management. Hawaiian communities depended on the sea for protein to support themselves. Under the feudal system of the time, the land and its adjacent sea were claimed by the king, who granted certain lands to high chiefs, who in turn granted certain places to lesser chiefs, in return for a portion of the products of the land and sea, as well as military support. (Kosaki, 1954: 1)

Traditional Hawaiian land management practices divided the islands into large districts called moku, governed by a high chief. Each moku was divided into ahupua‘a, which was governed by lesser chiefs. These ahupua‘a were strips of land from the mountain to the sea, and included the ocean waters adjacent to the ahupua‘a. The ahupua‘a included mauka areas that could be cultivated for food, forests that were the source of wood, plant products, birds, and other animals, and the nearshore ocean that were the primary source of protein for the Hawaiian people.

Each ahupua‘a was managed by a konohiki, designated by the chief of the ahupua‘a. The konohiki was responsible for regulating the harvesting of fish and other marine life, the cultivation of food and other useful plants, and the harvest of products from the mauka forests. Over time, “konohiki fishing rights” also became to mean the “chief’s or privately owned fisheries.” (Kosaki 1954: 1)

It was in 1839 that the first official recognition of konohiki fishing rights was made by Kamehameha III when he passed “An Act to Regulate Taxes,” which became Chapter III of the Laws of 1840, and contained a section entitled “Of free and prohibited fishing grounds,” which read in part:

His Majesty the King hereby takes the fishing grounds from those who now possess them from Hawaii to Kauai, and gives one portion of them to the common people, another portion to the landlords, and a portion he reserves to himself. These are the fishing grounds which His Majesty the King takes and gives to the people; the fishing grounds without coral reef, viz: the Kilohe‘e grounds, the Luhe‘e ground, the Malolo ground, together with the ocean beyond. But the fishing grounds from the coral reef to the sea beach are for the landlords and for the tenants of their several lands, but not for others. (Chapter III, Section 8, of Laws of 1840). (in Kosaki, 1954: 1-2).

The konohiki was given the right to regulate fishing in the waters adjoining his ahupua‘a “from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach” (Murakami in MacKenzie (Ed) 1991: 175). The other grounds outside the coral reefs are to open to all – the Kilohe‘e ground (area where squid was spotted and caught using a hook and line), the Luhe‘e ground (area where squid were too deep to be seen but were caught with cowry shell lures), the Malolo (flying fish) ground, together with the ocean beyond. In addition, the king kept for himself certain species from the fishing grounds seaward of the reefs. (Murakami in MacKenzie (Ed) 1991: 174)

In 1845 began the Great Mahele, which redistributed and privatized land all through the islands. After the Great Mahele, and the change of Hawaii’s land system, persons who became owners of land within an ahupua‘a were treated as tenants entitled to rights in the fishery of the ahupua‘a . The same rights were enjoyed by their lessees and renters. All of this was accommodated under the premise that the word “tenant” had been broadened, becoming almost synonymous with the word “occupant,” and including any *bona fide* resident of the land (Haalelea v. Montgomery, 2 Haw. 62 (1858); Hatton v. Piopio, 6 Haw. 334 (1882); Smith v. Laamea, 29 Haw. 750 (1927) in Meller, 1985: 6)

Meller notes that

During the division of lands at the time of the Great Mahele, title to konohiki fisheries normally was not part of awards made by the Land Commission. “The Land Commission did not decide on the question of...fisheries, except as incidentally to its other duties. (Jones v. Meek, 2 Jawy. 9 (1857), Judd v. Kuanalewa, 6 Haw. 329 (1882),; Bishop v. Mahiko, 35 Haw. 608 (1940); Chinen, supra, p. 13, note 10 in Meller, 1985: 8).

There were some minor changes when the law was redrafted in 1841 and 1845.

In 1851, a major revision of the law was passed “which unequivocally granted all fishing grounds pertaining to any Government land or otherwise belonging to the Government to the people for the free and equal use of all persons.” (Kosaki, 1954: 2).

In 1859, the Hawaii Legislature passed the Civil Code of 1859, and codified laws pertaining to konohiki fishing rights in sections 387 and 395. (Kosaki, 1954: 2)

Kosaki notes that

As evolved through the years, the main features of konohiki fishing rights are as follows:

- 1. Certain areas of the sea, from the reefs and, where there happen to be no reefs, from the distance of one geographical mile seaward to the beach at low watermark, are the private fisheries of the konohikis.*
- 2. Within these private ocean fisheries, fishing is restricted to the konohikis and the hoā‘ainas, or tenants of the lands (ahupua‘a) to which the fisheries were originally attached.*
- 3. The konohikis can regulate the fishing within the fisheries by one of the following two methods:*
 - (a) By setting aside or placing a tabu on one specific type of fish for their exclusive use;*
 - or*
 - (b) After consultation with tenants, by prohibiting fishing during certain months of the year and, during the fishing season, to exact from each tenant one-third part of all the fishes caught in the fishery. (Kosaki, 1954: 3-4)”*

As presented in the analyses by Kosaki (1954), Meller (1984) and Maly (2003), through this period of the Great Mahele to the 1893 revolution and Hawaii Organic Act in 1900, konohiki fishing rights went through a process of being formally recognized, and subsequently limited in scope and number.

The 1900 Hawaii Organic Act contained specific sections relating to fisheries, Section 95 and Section 96. They state:

Sec. 95. Repeal of laws conferring exclusive fishing rights. That all laws of the Republic of Hawaii which confer exclusive fishing rights upon any person or person are hereby repealed, and all fisheries in the sea waters of the Territory of Hawaii not included in any fish pond or artificial enclosure shall be free to all citizens of the United States, subject, however, to vested rights; but no such vested right shall be valid after three years from the taking effect of this Act unless established as hereinafter provided.

Sec. 96. Proceedings for opening fisheries to citizens. That any person who claims a private right to any such fishery shall, within two years after the taking effect of this Act, file his petition in a circuit court of the Territory of Hawaii, setting forth his claim to such fishing right, service of which petition shall be made upon the attorney-general, who shall conduct the case for the Territory, and such case shall be conducted as an ordinary action at law.

That if such fishing right be established the attorney general of the Territory of Hawaii may proceed, in such manner as may be provided by law for the condemnation of property for public use, to condemn such private right of fishing to the use of the citizens of the United States upon making just compensation, which compensation, when lawfully ascertained, shall be paid out of any money in the treasury of the Territory of Hawaii not otherwise appropriated. (Kosaki, 1954: 4)

Kosaki (1954) noted that:

Contained in the above sections are these salient points:

- 1. The intent of Congress to destroy all private fishing rights and to open the fishing areas to all citizens.*
- 2. The registration and adjudication of all private fisheries within the two year period following the enactment of the Organic Act.*
- 3. The condemnation of such registered fisheries by the Attorney General, and upon payment of just compensation, the opening up of such areas to public use. (Ibid)*

The U.S. Supreme Court reaffirmed the intent of Congress in this regard when it stated in *re Fukunaga*, (16 Haw. 306, 1904) that, “The intent of Congress is clear to destroy, so far as it is in its power to do so, all private rights of fishery and to throw open the fisheries to the people.”

At the time of the annexation of Hawaii, it could not be accurately determined how many private fisheries existed in the Territory (*Bishop v. Mahiko*, 35 Haw. 608 (1940) in Kosaki, 1954: 9). Of the estimated 300 to 400 private fisheries, about 100 were registered (Kosaki, p. 9).

Despite the fact that the 1873 and 1878 Boundary Review Commission records noted *konohiki* fishing rights for *Ki‘iokalani ahupua‘a*, *Puanui ahupua‘a*, and *Kehena ahupua‘a*, a review of copies of records compiled by the office of the Territorial Surveyor of all registered fisheries provided in Kosaki (1954) shows that no exclusive fisheries were registered in this area of North Kohala. If the fishery was not registered, then, according to *Bishop. v. Mahiko*, the right became invalid. (Kosaki 1954). Therefore, it is assumed that there are no *konohiki* fishing rights in the ocean area adjacent to the Proposed Action site.

Even the newspapers of the time confirmed the public perception of the *Bishop v. Mahiko* decision in an article in the *Honolulu Star Bulletin* of September 7, 1940, which stated: “Public right to the use of 262 sea fisheries in various parts of the Territory was established in an opinion by the supreme court...”, and further: “It was held that the law requiring registration of the lands was not unconstitutional and that owners who failed to register within the required time forfeited the fisheries to the public.” (Kosaki, 1954: 11)

Maly and Maly (2003) noted the transition during this time from the cultural subsistence fishing system with traditional values for fisheries to a commercial system with economic value of fisheries.

What evolved in Hawaii under western influence through the 1800s, and matured following the overthrow of the Hawaiian monarchy in 1893, was the development of a commercial fishing industry, involving significant trading centers and a market economy. The industry and growing number of urban consumers had little interest in the myriad traditional values – such as spiritual, cultural, familial, and ecological – fish and aquatic resources. (Maly 2003: ix)

Maly and Maly continue:

In the transition from a cultural subsistence-based system to the commercial economy, fish and other harvestable marine organisms went from being perceived and valued in a complex way that was embedded in nature and culture – one fostered through long-term stewardship – to fish as primarily being a commodity or simply food items. In the present day, the broad range of aquatic resources are no longer perceived as organisms irrevocably connected to the complex web of life, spanning water, land, air and culture. (Ibid.)

Nonetheless, in face of these changes in modern times, Maly and Maly emphasize that

we observe that one theme associated with fishing is consistent in oral history interviews with elder native Hawaiian fisher-people, and is also shared by other elder kama‘āina who learned fishing the “Hawaiian” way. It is that fishing and collection of marine resources requires caring for, and giving back, as a part of the taking. This manner of cultural subsistence may be summarized as “Hānai a ‘ai” (To care for and eat from). In the Hawaiian cultural context, subsistence was the traditional way of life, reflected in the relationship shared between nature and the kānaka (people). Subsistence is multi-faceted, including: intimate knowledge of the natural resources (from mountains to ocean depths); spiritual attributes; responsibility; and a physical relationship (Maly and Maly 2003: xi)

4.5 The Cultural Setting In the Region of Influence

The Region of Influence for cultural resources includes all harbor structures and facilities utilized by the proposed operation, and the proposed leased ocean area for the open ocean aquaculture operation. Document research and oral history interviews have not provided any oral tradition, legend, or cultural activity or Traditional Cultural Properties or Area of Traditional Importance associated with the preferred ocean lease site in Kohala off Malae Point in particular. There are no resources within the ROI that are listed on the National Register of Historic Places (NPS 2008). Interviews with kūpuna fishermen noted, and bathymetric charts confirm, that there is no underwater feature in the area of the ocean lease site that would serve to attract fish (Akau 2008, La'au 2008). Interviews with fishermen have indicated that the ocean lease waters were probably used for transit, trolling from nearshore to offshore locations. But, the site is not a specifically targeted area for the fisheries in the area, which tend to concentrate within ½ mile from shore for 'ōpelu and 1 to 1-1/2 miles from shore for trolling parallel to the shoreline for ono and mahi. The site is 2.6 nm offshore in an area that it is not used for trolling, net fishing, 'ōpelu fishing, bottom fishing, or other cultural practice. The proposed site is in waters of 220 fathoms, which are deeper than the deepest bottom fishing depth of 150-170 fathoms cited in interviews (Cambra 2008 and Fukuyama 2008), which will be discussed in the next section about the ocean area adjacent to the proposed ocean lease site.

4.6 The Cultural Setting in the Larger ocean area surrounding the Region of Influence, including nearby adjacent coastal waters

Looking at the area around the ocean lease site, interviewees describe that the primary cultural activity and resource in the general area is fishing. Fishermen as cultural practitioners utilize coastal fisheries all the way from Kawaihae to Mahukona - and with good weather, all the way to Polulu. Cultural activities today are a modern reflection of the same cultural activities of ancient times, including fishing in the coastal waters, and from the shoreline.

In the coastal ocean area within 1-1/2 to 2 miles from shore in this Kohala area, the ocean is well used for cultural practices of shore fishing, trolling, 'ōpelu fishing, bottom fishing, gathering and camping by native Hawaiian and kama'āina who have been associated with the land for many generations. Some kupuna remember stories of the land from their own lifetime of more than eighty years, and also tell stories heard from their grandparents of a time more than a hundred years ago (Akau 2008, La'au 2008, Ho'opai 2008).

Interviews with kupuna fishermen confirmed that in this part of the ocean, the cultural resources and practices of trolling, 'ōpelu fishing, and shoreline harvesting were all concentrated in coastal waters within 1 to 1-1/2 miles from the shoreline, or about two miles from the ocean lease site. (Akau 2008, La'au 2008, Ho'opai 2008, Richards 2008). Bottom fishing extended out to an area about one mile from the proposed ocean lease site (Fukuyama 2008, Cambra 2008).

Along this stretch of shoreline, there are numerous 'ōpelu ko'a located close to the coastline (La'au 2008, Cambra 2008, Fukuyama 2008), which are maintained by fishermen whose families have fished 'ōpelu for generations. 'Ōpelu ko'a are well known to the master fishermen, who tend these ko'a to prepare the fish for harvest during its proper season. Interviewees noted that there were 'ōpelu ko'a fishing grounds all along this part of the coast, within ½ mile from shore at locations close to Waiakailio Bay, all along the Red Hill (Pu'u Ulaula) area to Black Point (Malae Point), and Waiwaionū Bay at Puanui, and beyond to Keaweula Bay all the way to Mahukona (Akau 2008, La'au 2008, Cambra 2008, Fukuyama 2008).

In addition to the 'ōpelu, fishermen would also troll along the 30 – 40 fathom contour for ono, or other target species (Akau 2008, La'au 2008, Ho'opai 2008, Richards 2008, Fukuyama 2008). Fishermen would also fish for aku, during its proper season. And fishermen would also target onaga and other bottom fish (La'au 2008, Cambra 2008, Fukuyama 2008) along the coastline between Kawaihae to Black Point out to 150 fathoms (Fukuyama 2008) or 170 fathoms (Cambra 2008), which is about one mile from the proposed lease site (Fukuyama 2008), but still considered close (Fukuyama 2008 and Cambra 2008). Bottom fishermen north of Black Point to Mahukona targeted opakapaka at 85 fathoms (Cambra 2008 and Fukuyama 2008).

These 'ōpelu ko'a and bottom fish fishing grounds are very important natural and cultural resources and could be considered as an area of traditional importance. The 'ōpelu ko'a are located over two miles away from the proposed ocean lease site. The bottom fish grounds are about one mile away.

Hawaiian fishermen also ventured far offshore to catch fish (Newman 1968, Manu 1992, Maly 2003), so it is certainly possible the waters were used by Hawaiians to transit from the nearshore fishing areas to the offshore fishing area (Fukuyama 2008). However, interviewees noted the waters further offshore from Malae Point start to be affected by the Alenuihaha Channel with its strong winds and currents. They describe that offshore fishing was not favored in that area, and that fishermen tended to go offshore in the areas further south, off Kawaihae and North Kona areas (Fukuyama 2008, La'au 2008).

Historic remains on the shoreline area include many canoe hale, which indicate the large number of canoes used by those living in the general area in the past. In prehistoric and historic times, canoes traveling from Maui and Oahu to the island of Hawai'i and its leeward settlements may have passed through this general area. Larger population centers were located further to the north at the large fishing village at Lapakahi, and further to the south at Kawaihae. Travel along the coastal waters were probably following a course set close the shoreline to avoid the wind that is predominant in offshore waters.

4.7 The Cultural Setting in the Coastal land area adjacent to the ocean lease area:

To better appreciate the cultural landscape within which the ocean lease site is located, this analysis goes beyond the specified Region of Influence of the ocean lease site and the Kawaihae Harbor areas involved in the operation of the aquaculture farm, to include the cultural history of the land on the shore adjacent to the preferred site in North Kohala known as Pu'u Ulaula was researched to identify patterns of cultural activity, and identify native Hawaiian families and other kama'āina with historical associations with the land and adjacent sea. This helped to describe the cultural landscape of the region offshore which the ocean lease site is located.

While these ocean waters themselves are not specifically targeted for fishing purposes or other cultural practices, these ocean waters exist in the cultural context of the coastal lands adjacent to them. The coastal area due west of the ocean lease site is known as *Pu'u Ulaula*, or Red Hill. It is generally bounded on the north by Malae Point, (commonly known as Black Point) to Pahinahina ahupua'a in the south. From north to south, these nine ahupua'a include Ki'iokalani, Kaihooa, Pohakulu, Ahulula, Kokio, Kalala 1st, Kalala 2nd, Makiloa, and Pahinahina.

Legendary references to Western leeward Kohala, known as *Kohala Waho* are found in *He Moolelo no Makalei*, which was published in *Ka Hoku O Hawaii* from January 31 to August 31, 1928 and describes a story set in the 11th century CE about the creation of the most famous caves of the North Kona region (*Ke ana wai o Makalei*).

The moolelo includes information about the practices and traditional knowledge of *Kohala Waho*, as translated by Maly (Maly 2005 in UH-DURP 2005) including:

Po`a`aha (a type of braided fiber) was used as a racing baton. Fishing for malolo (flying fish). Fishing was regulated by season, malolo seasons ended when ahi (yellow fin tuna) began. Ahi fishing information: Used six ka`au (240') of `olona (woven mulberry fiber), bailers, water gourds, `ai pa`a (poi bundles), paka (sinker lines). Ko`a (proscribed fishing area) accessed using triangulation (kaulana). `Opelu is used as bait. Canoes used to fish for ahi had woven sails (palaumoena) and wooden masts (kia). Kukui nut was chewed then spit on the water to enable fishermen to see the bottom. To fish the `Awini ko`a, with its Kohalapehu winds, one had to sail all the way to Hana Maui to turn around. Other winds used were the Malani and Oninipua (also known as the Kuakualaeo). Ahi was given, traded, offered as sacrifice to ancestors and cordage, as well as cut up and dried, as well as given to villagers. The winds off of the ocean of Honopue were dangerous to fishermen. (Maly 2005 in DURP 2005).

This moolelo describes the relationship between leeward and windward Kohala, translated in Maly ((2005) in UH-DURP (2005)) as follows:

Leeward (Kohala Waho) was known for its expert fishermen. Ahi fishing was the major work of the leeward coast, Kohala was noted for its abundance. Ahi was said to control the “moku, kalana, the ahupua`a, the ko`ele” of Kohala Waho, was sought after in all six districts of the island of Hawaii. It was understood that Aumakua Lawa`ia and Ku`ula (ancestral fishing deities) observe fishermen to make sure proper protocol is followed: to give away fish freely to all those who assist in the catching: canoe carriers, elder fishermen, cordage makers, etc. Windward Kohala (Kohala Loko) people were known to be agricultural specialists. Exchange between the two was important: in the story, Makalei’s fishing skill brought an abundance of fish, which were traded with farmers from Halawa, Makapala, Niuli`i, Waiapuka, Pololu, and Honokane. Chiefly names listed corroborate the Mamiki article inference that place names in Kohala Waho are derived from chiefs: Makalei meets chiefs named Puakea, Pu`uonale and Kokoiki on his journey to Kohala Waho. Kapa`au was the name of a racer (kukini). Kohala was noted to have four divisions, one of which was said to be the `ilima land zone of the `Apa`apa`a wind (mentioned in Makalei’s pu`a chant). Makalei competed against Kapa`au, the champion of Kukuipahi (Chief of Kohala Loko) for the control of Kohala Waho.

Place names in the North Kohala area are described in this moolelo:

In Kohala Loko, in the uplands of Pu`uepa, was mentioned to be a center for chiefly sports. Associated with this district was a kahua le`ale`a (contest area), the playing of ke`a pua (sugar cane tassel stems), puu noa (a hide and guess game played with rocks and kapa bundles), and racing, which seems to have been an important game for the chiefs. Place names and land uses in Kohala Waho named included: Kahei, which had mo`aina (cultivate dry land parcels), `ilina

wai`ole (dry waterless lands), hono (sheltered areas) and `uala pu`e (sweet potato mounds) (Maly 2005 in UH-DURP 2005)

Maly provides a translation of what the moololo describes as ties between natural phenomena and traditional knowledge for the North Kohala area as:

Star constellations were used (Pleiades, here mentioned as Huhui, not Makali`i) to determine when to set sail on the fishing canoes, for during the high point of the rising of Huhui, “the wind blows with frequent lulls.” The `Apa`apa`a winds cause waves to break in white ridges, forcing one to land at Ha`ena. The `Awini Ko`a was accessed only when the “kohalapehu” wind was not blowing for it created unusually large waves, the size of houses. The month of Kohalapehu wind was Hilina during raining season. This wind was thus known for it pelted the natives and destroyed canoes. The time to catch ahi was in the months of Kaulua and Nana: it said that during this time the water is calm, birds take flight (to show where the schools are), uhu are out in abundance near the cliffside. More traditional knowledge of the months listed as it relates to fishing conditions in Kohala Waho: Kaulua was said to have had temperamental weather, rain and sun intermixed, the month of Ikuwa is a time of thunder; Nana is the time when there is no storms, when the ocean is calm. This is the ideal time to fish.” (Maly 2005 in UH-DURP 2005)

Another legend Ka`ao Ho`oniua Pu`uwai no Ka-Miki, serialized in the Hawaiian language newspaper from 1914 to 1917, was set in the 12th – 13th century. This is translated in outline form in a report by Maly (Maly undated in UH-DURP 2005), which states that

Kohala waho had a large population extending from the sea to upland koai`e and mamane forests, with awa, sugarcane, banana plantations in the uplands and fishing on the coasts. Kohala was ruled by two chiefs during this time: Kapa`au-iki-a-Kalana and Hikapola. Hika often organized sporting events. The names of the characters in this story coincide with place names of Kohala waho including Hikapoloa (Alii nui of Kohala waho), `Upolu (pukaua or general), Honoipu (`alapa or competitor in athletic contests), Ho`ea (kukini or runner), Puakea (koa or warrior), Kukuipahu (wife of Hikapoloa), Ha`ena, Awalua, Kapa`a Kaipuha`a, and Puu`epa (olohe or lua warriors and lesser chiefs), Kahua and Kai`opae (Chiefs and guardians of Lamaloloa), Lamaloloa (Master competitor and fighter for Hikapoloa), and Kepaka`ili`ula (child of Hikapoloa and Kukuipahu) (Maly, undated) in UH-DURP 2005.

A Preliminary Chronology of North Kohala in the UH DURP *North Kohala Coastal Cultural Resource and Heritage Landscape Study* (2005) provides a description of the legendary past related to this area taken from Tomonari-Tuggle 1988: 8-9):

Papa and Wakea are considered the residence of Oakea and Opapa (Wakea and Papa)... the god and goddess who made Hawaii and all the others of this group of islands (in Damon 1927: 54). Pa`ao is credited with the establishment of a new political and religious order, which set severe sanctions for religious observance emphasizing the separation of chief and commoner. Pa`ao brought with him Pili-

Kaaiea, a Tahitian chief, to rejuvenate the royal Ali`i line This line of chiefs, from which the Kamehameha dynasty emerged is one of the three lines of descent through which Hawaiian ali`i traced their genealogies; the other two are the `Ulu and Nana`ulu lines (Malo 1951: 6). Pa`ao is also credited with the construction of the Mo`okini Heiau at Pu`uepa. (DURP 2005).

In the West Kohala area, initial settlement occurred in approximately 800 – 1000 CE. There is historical evidence of small fishing settlements along the shoreline of this region consisting of house sites, canoe hale, small gardens, walls, all connected by a coastal trail. (Bonk 1968 and Newman 1968). Fresh water was apparently very limited, but could be found in springs, water caves, dew fall and catchment to irrigate gardens. These fishing villages likely focused daily life on the ocean and used the ocean near here for fishing purposes. Significant settlement begins approximately 1400 through 1850 including permanent and temporary habitations, burials, heiau, trails, and holua. (Maly undated in UH-DURP 2005)

A Preliminary Chronology of North Kohala in the UH DURP *North Kohala Coastal Cultural Resource and Heritage Landscape Study* (2005) provides a description of early settlement for this area:

Initial utilization, probably by a small founder population, is characterized by a short-term or transient occupation mainly near richer subsistence resources, primarily along the coast. Dispersed and spaced pattern of isolated coastal communities as a result of exploiting the best-unoccupied environments. It is suggested that initial settlements occurred in maximum resource zones such as the kula gulches. A description of the leeward coast is given for this time by Rosendahl (1972: 445): "...from sea level to about 1300 feet in elevation (10 to 40" annual rainfall), the setting was an arid to semi-arid rocky slope dominated by pili grass... to the virtual exclusion of most other flora species. The upper portion of Lapakahi, extending up to about 1800 feet, probably corresponded to the lower limits of an open, mixed dryland forest, which dominated the further mauka leeward slopes of the Kohala Mountains. Narrow fingers of forest would have extended further makai, below the general forest limits, in the relatively moister gulches and gully channels (cited in Tomonari-Tuggle: 12-13). A sequence of occupation for the leeward coast of North Kohala has been offered by Tuggle and Griffin (1973: 61, 63):

Between c. AD 1450-1500 two major events occurred: an expansion in the upland area and the development of dryland agriculture; and construction of the "Great Wall" and adjacent platforms in the hamlet of Koaie. These events were interpreted as indicators of the development of Lapakahi as a distinct social and political unit with distinct social classes and consolidated power. By c. AD 1600, settlement was expanding along the coast in conjunction with intensification of the upland field systems. Tuggle and Griffen (1973: 63) attribute the expansion of settlement, and the intensification of marine resource exploitation and upland agriculture, to the demand of a stratified social system. By AD 1778, resource production had reached its peak and the population began to decrease. Much of the upland agricultural system and coastal habitations outside the hamlet were abandoned by the early 1800s. (UH-DURP 2005)

Kirch (1994) says that as Hawaiians left the windward valleys and moved to more arable lands, these field systems became of primary importance. The Kohala field system developed over about a 350-year period, from A.D. 1450 -1800, and was followed by a rapid collapse and abandonment after European contact (Kirch 1994).

In his cultural study of the Pu‘u o Umi Natural Area Reserve and the Kohala-Hamakua mountain lands, Maly (2004) describes that by 800 – 1000 AD,

The population began expanding to the kona (leeward) side and more remote regions (Cordy 2000: 130), Kirch (1979) reported that by about AD 1200, there were small coastal settlements at various areas along the western shore line of Hawaii for example, the Waimea lands of Anaehoomalu, Kalahuipuaa and Puako and Kawaihae (Kirch 1979: 198). These leeward coastal lands provided the nearshore and deep sea fishery resources necessary for the families of the larger Waimea region. In this system, the nearshore communities shared extended familial relations with those of the Waimea uplands. (Maly 2004: 4)

Maly continues:

By the 1500s and 1600s, residency in the uplands was becoming permanent, and there was an increasing separation of royal class from commoners. During the latter part of this period, the population stabilized and a system of land management was established as a political and socioeconomic factor (see Kamakau 1961; Ellis 1963, Handy, Handy and Pukui 1972; Tomonari-Tuggle 1985 and Cordy 2000) (Maly 2004: 4)

and

In the generations that followed initial settlement, the Hawaiians developed a sophisticated system of land use and resource management. By the time Umi-a-Liloa rose to rule the island of Hawaii about 1525, the island (moku-puni) was divided into six districts or moku-o-loko. Kohala extending from the slopes of Mauna Kea in the south, across the Kohala Mountains, and to Upolu Point in the north, is one of those major districts (Maly 2004:5)

The large districts like Kohala and subregions (‘okana and kalana) were further divided into political regions and manageable units of land. These smaller divisions or units of land were tended to by the maka‘ainana (people of the land) (see Malo 1951: 63-67). Of all the land divisions, perhaps the most significant management unit throughout the islands was the ahupua‘a. (Maly 2004:5)

There is historical evidence of small fishing settlements along the shoreline of this Pu‘u Ulaula region consisting of house sites, canoe hale, small gardens, walls, all connected by a coastal trail. (Bonk 1968, Newman 1968, Clark 1986). Fresh water was apparently very limited. These fishing villages likely focused daily life on the ocean and used the ocean near here for fishing purposes. Newman (1968) describes fishing activities in general for Hawai‘i in this precontact time with the primary focus of fishing using the ocean area within ½ mile from shore for different types of fish, along with trolling further offshore. A further discussion on fishing techniques in historical times is included below.

This is a coastal area with historic remains indicating that it was inhabited with small gatherings of houses, yards, and canoe houses in various embayments along the coast. More people were living mauka than on the makai lands (Ellis, 1963, Clark 1986). Clark (1986) describes this as a dual settlement pattern with more settlement mauka in the “kula” area, and sparse coastal settlements.

Along the shoreline is a section of the Ala Kahakai National Historical Trail, that connects ancient and modern trails along the shoreline and mauka-makai. The Ala Kahakai National Historical Trail recognizes the significance of the coastal trail and its corridor as a cultural resource that shaped the Hawaiian culture. While the Pu‘u Ulaula area of North Kohala is included in the designated Trail system, it is outside the priority area for implementing the 15 year planning period for all alternatives in their recent Draft Comprehensive Management Plan and Environmental Impact Statement (AKNHT-NPS 2007, p. 5) Maps in this draft plan showing the North Kohala region of the Trail note that the land in the Pu‘u Ulaula area is government owned land, except for Ki‘iokalani. The map names the area “Kahuā Ranch, Ponoholo Ranch (Malae Point), and indicates there was a possible lateral trail along this coastline (AKNHT - NPS, 2007, p. 99).

Bill Bonk did an archeological survey of the coastline from an area north of Kawaihae to Mahukona in 1968. His map associated with this study is included above in Figure 3. In describing the area of Pu‘u Ulaula, Bonk describes two major bays in the area with evidence of more houses - one at Waiakailio Bay (at the southern end of the Pu‘u Ulaula region of coast), and another bay to the north, which was probably Waiwaionū Bay at Puaiki and Puanui ahupua‘a.

Waiakailio Bay undoubtedly was an important settlement in the prehistoric as well as historic period. Prehistoric house sites, canoe sheds and other remains of ancient man are interspersed with the remains of more recent activity. A windmill for pumping water from a well is still to be seen there together with the more recent foundation for a gasoline driven motor pump. This bay was undoubtedly a fairly important location for the shipping of cattle. (Bonk, p. 21)

“Many of these small coastal indentations might readily have served as loading points for the shipping of cattle.” (Ibid. p. 31)

Bonk also mentions numerous canoe sheds associated with house sites (Ibid.). He describes a typical house site in the area or Waiakailio Bay as

Two cairns within the walled yard probably resulted from the piling up of rock in the clearing of the yard. The yard itself is divided into a lower and upper portion. This results from a north-south wall through the yard. Probably the lower western section was used for planting. Two walled enclosures in the southwestern portion of the site, one 15 feet by 15 feet, the other 11 feet by 13 feet may have been used as pens. Another platform at the far southwestern portion of the site probably was also used as a kalua. (Bonk, p. 28)

Bonk does not mention anything at Malae Point itself. But, going further north, Bonk discovered a small bay with remains of several houses, burials, canoe houses. This was probably Waiwaionū Bay at the Puaiki and Puanui ahupua‘a.

At a small bay north of Malae Point is an excellent landing place for canoes. Numerous stone walled structures and a few scattered rock graves are found in and around the bay. Pieces of coral are scattered on these graves.

There are numerous small inlets along this coast, many with small coral pebble beaches. This coastal region contains some very excellent fishing grounds. Uhu (Parrot fish) are especially numerous along this coast. Fishing certainly must have been one of the important reasons for settlement along this coast in prehistoric times. Little change has been noted in this regard, for during our three week period in the field, not one day passed without seeing at least one fishing boat offshore. Shore fishermen were also in abundance and the remains of their sojourns litter the coast with the cultural debris of our modern age.

Another reason for attracting temporary or permanent residents to this area was the protection afforded by the Kohala mountains to the coastal region of the southern part of north Kohala. I was told on more than one occasion that the area between Waiakailio Bay and the point south of Keaweula Bay is normally well protected even during those periods when coastal areas to the north and south have heavy winds, resulting in choppy seas. The southern section of north Kohala coast however, normally is protected by the trade winds. The sea is therefore relatively calm during a good portion of the year and as a result this is an area where small boats might normally heave to if threatened by high seas.” (pp. 36-37)

Coastal dwellers harvested the sea in a variety of fisheries, and they grew plants using what limited fresh water they could obtain. And they depended on trade with the mauka dwellers who would trade meat and produce for fish (Ho‘opai 2008, Akau 2008, and Clark 1986).

The following excerpt is from Clark’s 1986 treatise, “Waimea – Kawaihae: A Leeward Hawaii Settlement System”

Kohala Coastal Zone Beyond Kawaihae

Kawaihae was the most important settlement along the Kohala coast but it obviously was not the only one. The environmental characteristics of the region to the north of Kawaihae differed from those to the south, and there was a corresponding difference in the nature of the human occupation in the two areas. That difference is illustrated in the following review of the archaeological data on the CZ settlement in leeward Kohala to the north and to the south of Kawaihae.

North of Kawaihae

To the north of Kawaihae, the coast was environmentally similar – arid, rocky, grass-covered and backed by the Kohala slopes. While historic sources tell us little about the settlements along the coast to the north we do know that some which existed in the Early Historic and Transformational Phases (and presumably in the prehistoric period as well) were Owawalua (Ellis 1969: p. 396), Hihuu (Ellis 1969: p. 396), Mahukona (Wilcox, in Damon 1950: p. 146), Koaie (Newman 1970; Tuggle and Griffin 1973), Kipi, and four other villages between there and Kawaihae (Ellis 1969: p. 288).

As one moves further north from Kawaihae the separation between inland agricultural fields and the coast diminished, eventually disappearing near the north point of the island

where the leeward environment gives way to the windward. The populous and fruitful occupation of extreme northwest coastal Kohala provided a marked contrast to the southerly region of the district (Portlock 1789: 145; Menzies 1792: 52; Vancouver 1967: 11, 112; Kotzebue 1821; 295).

Archaeological data on the coastal occupation north of Kawaihae comes primarily from the works of Soehren (1969), Bonk (1968), and Tomonari-Tuggle (1981), who conducted surveys along the coast, and the various participants in research at coastal Lapakahi (Pearson 1968; Newman 1970; Tuggle and Griffin 1973).

North of Ward 1, yet still within the ahupua`a of Kawaihae 1, there are a few structures situated along the coast in comparative isolation. These appear to be principally shelters or possible Extended Domestic Units (EDUs). A small settlement was situated around the mouth of the prominent Honokoa Gulch, however, which is where Bonk's (1968) survey data begin. Included in this cluster are a few Extended Domestic Units (EDUs), one and perhaps more Permanent Domestic Units (PDUs), a canoe shed, a possible religious structure, a large salt pan, and some wall segments. Not far beyond this group are two other neighborhoods. The first consists of four Domestic Units (DUs), probably extended, and the second, a short distance away, is composed of an historic PDU, four probable EDUs, and a wall segment. From there to the Kawaihae 1 border and the boundary between North and South Kohala are only a couple of shelters and one or two isolated DUs (probably extended). In other words, there was little or no occupation in the area on either side of the district boundary suggesting that while the formal North-South division of Kohala dates to the historic period, it may mark a much older socio-political distinction of some kind.

Soehren's, Bonk's, and Tomonari-Tuggle's surveys, which focused on CZ1, indicate that beyond the ahupua`a of Kawaihae 1 the northern coast is dotted with a variety of structures, some isolated, others in small clusters, and still others in larger settlements. At this point, I cannot correlate the "villages" mentioned historically with specific archaeological settlements. None of the settlements compare with Kawaihae in size or importance.

North of the district border the first settlement encountered is a small one situated at the mouth of Kapae Gulch (site 4157) (Bonk 1968). This is a small settlement where only one ward can be identified. Along with two small shelter caves at the side of the gulch, there appear to be five or six PDUs. Three of these have walls around house and "yard" but no non-indigenous artifacts suggesting occupation into, if not exclusively during, the historic period.

The first sizable settlement north of the district border is at Waiaka`ilio Bay (site 4156). Perhaps as many as 25 to 30 DUs, most of which may have been permanent, were reported along with numerous shelters and recent encampments. Some of the DUs were historic but most seem likely to have been prehistoric. Also present were two canoe sheds, a possible heiau, and some scattered burial monuments. Bonk (1968: 21) concluded the "Waiaka`ilio Bay undoubtedly was an important settlement in the prehistoric as well as historic period."

At the ahupua‘a of Kalala there is a scattering of residential sites along the coast but no large clusters of houses. A small settlement may have been situated in the vicinity of Pu‘u Ulaula but most of the DUs there seem most likely to have been historic, at least during their last phase of occupation (Bonk 1968:35).

The land units of Pohakuloa, Kaiho`oa, and Ki‘iokalani again lack sizable coastal settlements. A small settlement of several DUs appears to have been present at a small bay just north of Malae Point. Most of the structures along this portion of the leeward coast were probably RUSs and perhaps EDUs which were occupied in order to exploit the good fishing grounds (Bonk 1968: 36-37).

For Puanui and Kehena land units there are again scattered shelters and DUs.

A settlement of note was located at Keawanui Bay. It consisted of at least two major canoe sheds, at least four PDUs, numerous EDUs, and seven large salt pans (Bonk 1968: 38-40; Soehren 1969:23). Many more DUs would probably be revealed through intensive survey at this locale. Bonk (1968:38) described it as “a fairly significant settlement in prehistoric times. (Clark 1986, pp. 295-299)

The report continues its description of the coastal settlement patterns at Kaupalaoa, Makeanehu, Kaiholena, Paoo, Lamalao, Kaipuhaa ane Lapakahi. Clark concludes by saying,

I have attempted to divide the sites at the settlement into CZ1 and CZ2 groupings and have then recalibrated the chronometric dates available for each area (see Table 6.2). Their results suggest a striking difference between the two subzones. The occupation span for CZ1 stretches from about AD 1250 to some time after 1825. For CZ 2 the occupation span is approximately AD 1600 to shortly after 1800. While the actual time differential in settlement of CZ 1 and CZ 2 may not be as great as indicated from these limited data, the evidence is very strong the CZ1 was indeed settled significantly prior to CZ2 at Lapakahi. (Clark 1986, pp. 300)

In his journal of 1823, under the entry: “Kawaihae Back North Toward Mahukona by Thurston, William Ellis writes, “The coast was barren; the rocks volcanic; and Mr. Thurston was informed that the inhabitants of the plantations, about seven miles in the interior, were far more numerous than on the shore. (Newman, p. 288). Newman notes: “This distance is erroneous for that would place them on the other side of the Kohala Mountains – probably more like 2-3 miles.” (Newman, p. 250)

All the land in the Pu‘u Ulaula region, including the ahupua‘a of Kaihooa (at Malae Point), Pohakuloa, Ahulula, Kokio, Kalala 1st, Kalala 2nd, Makiloa, and Pahinahina were retained by Kamehameha I, and were later transferred by King Kamehameha III in “An Act Relating to the Crown, Government, and Fort Lands, in 1848” to become the lands of the Hawaiian Government. After the overthrow of the Hawaiian Kingdom in 1893, the lands became part of the Territory of Hawaii. And, after statehood, the lands became part of the state of Hawaii.

Contiguous and to the north of the Government lands in the Pahinahina lease is the ahupua‘a of Ki‘iokalani, located at Malae Point. This ahupua‘a was granted by King Kamehameha I to John Young, his trusted advisor (Cahill 1999), who in turn bequeathed it to his daughter, Fanny Kakelaokalani Young in a will he wrote in 1834 (Cahill 1999: 147). Fanny “Pane” Young was born of John Young and his second wife, Kaoanaeha, niece of Kamehameha I. While Hawaiian newspaper reports on July 14, 1848,

that the Kiʻiokalani ahupuaʻa was granted to the government by Kamehameha III, and accepted in legislative Council on June 7, 1848 (Ka Elele, July 14, 1848), it was on December 13, 1878, that the Kiʻiokalani ahupuaʻa was awarded to Fanny “*Pane*” Young under Royal Patent 7216, and finally under Land Court Award 8519-B Apana 2. Please see Appendix A for a copy of this Royal Patent.

As part of the process started in the Great Mahele, in 1873 and 1878, the Boundary Commission gathered information on the ahupuaʻa from informants to determine the disposition of the lands.

The coastal region east closest to the Proposed Action site is Malae Point and the area around it. Malae Point is the boundary of two ahupuaʻa: Kaihooa and Kiʻiokalani. To the south of Malae Point are the ahupuaʻa of Pohakulu and Ahulula. Further to the south is the Puʻu Ulaula region including Kalala (1&2), Makiloa and Pahinahina. To the north of Malae Point is Waiwaionu Bay which includes Puaiki ahupuaʻa and Puanui ahupuaʻa. Further to the north is the Keawanui Bay region including Kehena (1&2), Kipi and the Kaupalaoa ahupuaʻa. For the purposes of this analysis, the six ahupuaʻa surrounding Malae Point are further analyzed to learn the names of the ahupuaʻa and places on them.

In the UH DURP 2005 North Kohala Coastal Cultural Resource and Heritage Landscape Study there are two tables which provide information on the names of the ahupuaʻa, and places associated with these ahupuaʻa. One table is entitled: “Boundary Descriptions Table” and the other is entitled: “Kohala Boundary Claims Data Synthesis Part I – Kohala Iwaho (Outer Kohala)” (DURP 2005). There were three informants that provided this information named Kekuaaea (1878), Pohakuauli (1878) and Kanaha (1873 and 1878). (UH-DURP 2005).

Figure 6: Information on six ahupua`a in coastal region around Malae Point (UH-DURP 2005)

Ahupua`a name	Meaning	Boundary Description (from informants as noted, referenced in DURP 2005)	Land Ownership (from “List of N. Kohala Ahupua`a” in UH-DURP (2005))
Puanui	Big Flowers	Kanaha (1873) notes areas used for cultivation as well as ancient road systems. This ahupua`a was noted as having ancient fishing rights extending out to sea.	Land Court Award 9971:20 to W. P. Leleiohoku, currently owned by B.P. Bishop Trust, leased to Ka`ike o Ka`aina.
Puaiki	Small Flowers		Returned by L. Kamehameha, returned by aupuni, became government land, the makai parcel deeded to Kahua Ranch in exchange for other mauka lands.
Ki`iokalani	Statues of the Heavens	Kekuaaea states: “thence to Ahuliilii, a resting place. The compass was put here to sight to Puulepo; thence makai to Pukoae, a resting place; thence to Malae, a point at the shore; bounded makai by the sea. Ancient fishing rights extending out to sea...” (Vol. B:276 in UH-DURP 2005). Pohakuauli stated at the same time that Kiiokalani was “bounded makai by the sea, where we went fishing; we had to give fish to the Konohiki...” (Vol. B:277 in Boundary Descriptions Table of UH-DURP 2005)	Land Court Award 8519-B:2 to Fanny Young, ahupua`a acquired by Kahuā Ranch, and makai parcel now owned by Ponoholo Ranch.
Kaihoaa			Returned by L. Kamehameha and Leleiohoku, Returned by aupuni, became Government Land
Pohakulua	Double Stone		½ returned by E. Kekela, no Land Court Award, ½ returned by E. Kekela, returned by aupuni, became Government Land
Ahulua			Government Land, omitted in the Mahele

Of the six ahupua`a, two (Ki`iokalani and Puanui) had place names noted in Boundary Commission testimonials that were translated and provided in the DURP 2005 report table entitled: “Kohala Boundary Claims Data Synthesis Part I – Kohala Iwaho (Outer Kohala) (DURP 2005). Figure 6 describes place names in the Ki`iokalani ahupua`a and Figure 7 describes place names in the Puanui ahupua`a.

Figure 7: Place names in Ki`iokalani ahupua`a from Boundary Commission testimonials (UH-DURP 2005)

Site name	Description	Informant
Puulepo (“Hill of Dirt”)	Located just above gov’t road to Kawaihae	Kekuaaea, 1878
Anuliilii (“A Little Bit Cold”)	A resting place	Kekuaaea, 1878
Puukoae (Hill of the Koaie (either a bird or a banana variety))	A resting place	Kekuaaea, 1878
Malae (Serene)	A point on the coast	Kekuaaea, 1878
Kaihooha		Pohakuauli, 1878
Kunohohuiwai	A place to set water calabashes	Pohakuauli, 1878
Ki`iokalani (“Statue of the Heavens”)	A kauhale (traditional housing complex) was noted as having the same name as the ahupua`a	Pohakuauli, 1878
Keeokalani	This place was located on the shoreline, and seems to be the same name of the sand at this site.	Kanaha, 1878
Puuokawa	Place name	Kanaha, 1878
Ahuapaoo	Name of a farm site, or mahina ai	Kanaha, 1878
Keanakaluapuaa	Possibly associated with a site for cooking pigs	Kanaha, 1878
Kealapakala	Place name	Kanaha, 1878
Koaiea	A kihipai or smaller land division in an ahupua`a	Kanaha, 1878
Puupuleha	The name of the house site of the informant	Kanaha, 1878

Figure 8: Place names in the Puanui ahupua`a from Boundary Commission testimonials (UH-DURP 2005)

Site name	Description	Informant
Puanui	Areas used for cultivation as well as ancient road systems. this ahupua`a was noted as having fishing rights that extended out to sea	Kanaha, 1873
Kihelea	Located near a road to Puuhue Hill	Kanaha, 1873
Wawahonu	A point on the shoreline near a landing area	Kanaha, 1873
Pohakupuloa	Place Name	Kanaha, 1873
Luakii	A spring located at the mauka end of this ahupua`a	Kanaha, 1873
Kaihoa	Place Name	Kanaha, 1873
Malohaumia	The cultivation area of the informant	Kekuaia, 1873

Of these six ahupua`a, two of them are noted as having fishing rights that extend out to sea at that time: Ki`iokalani and Puanui. In addition to these two areas, the next closest area of konohiki fishing rights was further north in the ahupua`a of Kehena, which was noted as having ancient fishing rights extending to sea (UH-DURP 2005 “List of ahupua`a in N Kohala”).

As presented in the analyses by Kosaki (1954), Meller (1984) and Maly (2003), through this period of the Great Mahele, the Boundary Commission hearings, and up to the 1893 revolution and Hawaii Organic Act in 1900, konohiki fishing rights went through a process of being formally recognized, and subsequently limited in scope and number.

A revolution in 1893 replaced the monarchy with a provisional government and then a republic, which was annexed to the United States in 1898 as a territory (Dorrance and Morgan 2000; Kuykendall 1968; Tomonari-Tuggle 2002).

The 1900 Hawaii Organic Act contained specific sections that repealed most exclusive fishing rights and made fishing open to all citizens. If anyone claimed exclusive fishing rights, these must be registered.

In 1904, the U.S. Supreme Court reaffirmed the intent of Congress in this regard when it stated in *re Fukunaga*, (16 Haw. 306, 1904) that, “The intent of Congress is clear to destroy, so far as it is in its power to do so, all private rights of fishery and to throw open the fisheries to the people.”

At the time of the annexation of Hawaii, it could not be accurately determined how many private fisheries existed in the Territory (*Bishop v. Mahiko*, 35 Haw. 608 (1940) in Kosaki 1954: 9). Of the estimated 300 to 400 private fisheries, about 100 were registered (Kosaki 1954: 9).

Despite the fact that the 1873 and 1878 Boundary Review Commission records noted konohiki fishing rights for Ki`iokalani ahupua`a, Puanui ahupua`a, and Kehena ahupua`a, a review of copies of records compiled by the office of the Territorial Surveyor of all registered fisheries provided in Kosaki (1954) shows that no exclusive fisheries were registered in this area of North Kohala. If the fishery was not registered, then, according to *Bishop. v. Mahiko*, the right became invalid. (Kosaki 1954). Therefore, it is assumed that there are no konohiki fishing rights in this area of ocean adjacent to the Proposed Action site.

It was in the late 1880s that ranching started as a major land use in this region surrounding Malae Point and the Pu`u Ulaula area. A number of ranchers began to work the lands including Holmes, Burchardt, MaGuire, Austin and Frank Woods. (Schweitzer 2003, pp. 197-199) The area of Pu`u Ulaula is one subregion of the larger Kohala region between Kawaihae and Mahukona including the ahupua`a from Kehena, Pu`uhue, Ki`iokalani, Kawaihae Uka, and Kahuā. Land use in this area and cultural practices remain active in the ranching tradition that has not much changed since the 1880s, when Kohala’s ranches were established.

The development of ranching as a major land use in the region was advanced in 1928 with the establishment of Kahuā Ranch by Atherton Richards and Ronald von Holt, which included about 12,000 acres of land. (Schweitzer 2003). This included fee simple and leased land under ranch management. Among these leased lands is the Pu`u Ulaula region known as the Pahinahina lease, which has been leased by Kahuā for pasture purposes for generations. This lease extends from Kaihooa ahupua`a in the north to Pahinahina ahupua`a in the south. Kahuā Ranch acquired Ki`iokalani ahupua`a and used it as pasture, and transferred title of the makai parcel to Ponoholo Ranch.

For over a hundred years, the dominant use of the shoreline area around Malae Point and the Pu`u Ulaula area has been associated with ranching, and recreational and subsistence use by the paniolo families from Kahuā Ranch.

Kahuā Ranch had its beginnings with George Frederick Holmes at about the 3000’ elevation. In April 1886, the Ranch was purchased by the Burchardt brothers, Fred Godfrey and Ernest, from Puuhue with their partner, John Maguire. In 1891, Maguire bought out the Burchardt share of the ranch, when they returned to England. In 1896, Maguire sold a 50 acre Kahuā homestead to Frank Woods, James Woods’ younger son. They also leased land around the homestead from Captain Austin, whose wife was a descendant of Kamehameha and had substantial land holdings in the Kawaihae general area.

After losing an expensive water rights dispute, and not getting a renewal on the lease of Austin lands, Frank Woods was not able to keep the ranch. (Schweitzer and Gomes 2003, Melrose 1999). As soon as word got to Oahu that Frank Woods had lost the ranch, Ronald Von Holt partnered with brothers Atherton Richards and Herbert Montague “Monty” Richards, to buy Kahuā and the lease. Ronald Von Holt was grandson of a German immigrant to Hawai‘i. Brothers Atherton Richards and Herbert Montague “Monty” Richards were grandsons of an early missionary pioneer to Hawaii. After

negotiations, they were successful in acquiring the fee simple land and leased land that made up Kahuā Ranch.

Schweitzer and Gomes (2003) stated:

The trio named their new adventure Kahuā Ranch, Ltd. It stretched from the misty `ohia forests filled with native birds at 3,250 feet elevation down to arid pasture land five hundred feet above the sea, at the time about twelve thousand acres all in all. About fifty people worked for von Holt and Richards. Workers' families lived on the ranch, as did immigrant families who leased to homestead and raise crops such as corn. In early years, there was even a school for the first three grades, Pohakuloa or Kehena School, close to the Lincoln family home (p. 198).

Today, the lands of Kahuā and Ponoholo Ranch include fee simple and leased land from the State of Hawai'i. Among these leased lands is the Pu'u Ulaula region known as the Pahinahina lease, which has been leased by Kahuā from the State for pasture purposes. This lease represents over 4,000 acres of state land including the ahupua'a of Kaihooa (at Malae Point), Pohakulu, Ahulula, Kokio, Kalala 1st, Kalala 2nd, Makiloa, and Pahinahina. Kahuā Ranch brought water from the mauka area to the Pahinahina lease for their cattle (Richards, 2008). Kahuā Ranch also owned the entire ahupua'a just north of the Pahinahina lease, called Ki'iokalani all the way to the ocean at Malae Point. (Richards 2008)

Kahuā Ranch was led for fifty years by Monty Richards, the nephew of Atherton Richards and son of Monty Richards, cofounders of Kahua Ranch. In 2004, Monty turned over reins of Kahua Ranch to his son, Tim Richards. In 1989, part of Kahuā Ranch split off to form Ponoholo Ranch, which is currently run by Pono Von Holt, the son of Ronald Von Holt. In this process, the makai parcel of Ki'iokalani was transferred to Ponoholo Ranch. Interviewees report that the shoreline area of Ki'iokalani, Puaiki, and the Pu'u Ulaula area has been used by the paniolo families from Kahuā Ranch since the Ranch started in 1928 (Ho'opai, 2008, Richards 2008, Von Holt 2008).

Because of this historical association that Monty Richards and Pono Von Holt have with the Pahinahina lease, and Ki'iokalani, local kupuna, William Akau recognized that Monty Richards and Pono Von Holt would be the modern-day caretakers or konohiki of the area of ocean where the proposed lease site is located. Akau emphasized that Kahuā Ranch and Ponoholo Ranch own or lease all the ahupua'a in that area and have ranched the land there for generations. He said that the Ho'opai family should be consulted since they have been the Hawaiian paniolo family using the area for generations. He also said to talk with some longtime fishermen in the area.

It's important to recognize that according to records of all registered fisheries in the office of the Territorial Surveyor, none were located off Ki'iokalani ahupua'a, or other ahupua'a in the Pu'u Ulaula region of North Kohala. So, there are no legal konohiki rights or registered fisheries in the area. Rather, Richards and Von Holt are recognized as konohiki in the sense of being the stewards of the land in the area.

To the North of Malae Point in the small bay of Waiwaionū, bounded by Ki'iokalani ahupua'a and Puaiki, the ahupua'a adjacent to Ki'iokalani to the north. Puaiki ahupua'a was transferred by King Kamehameha III in "An Act Relating to the Crown, Government, and Fort Lands, in 1848" to become the lands of the Hawaiian Government. After the overthrow of the Hawaiian Kingdom in 1893, the lands became part of the Territory of Hawaii. And, after statehood, the lands became part of the state of Hawaii. The ahupua'a mauka of Akone Pule Highway is leased to Parker Ranch under Revocable

permit S-3219. The parcel of land in the Puaiki ahupua‘a that is makai of Akone Pule Highway was transferred in 1967 by the State of Hawai‘i to Kahuā Ranch in exchange for the State obtaining other Kahuā Ranch land for highway purposes under Grant S-14,716 to Kahuā Ranch, Ltd. The mauka lands of Puaiki ahupua`a and Puanui ahupua`a were leased by Parker Ranch and used as pasture.

Adjacent to the north of Puaiki is the Puanui ahupua‘a, where there was a larger settlement as indicated by the substantial historic remains described by Bonk (1968) and Clark (1968). The land was awarded to William Pitt Leleiohoku through Royal Patent 8161, Land Commission Award 9971, Apana 20. Leleiohoku, a Prince of the Kingdom of Hawaii, in turn willed the land to his first cousin, Princess Bernice Pau‘ahi Bishop, and the land is now part of the Kamehameha Schools/Bishop Estate land holdings. The current lessee is Ka`ike o Ka`aina, a nonprofit educational and cultural organization, whose President is Michael Hanohano. This is a nonprofit native Hawaiian group of kūpuna dedicated to education and cultural programs for keiki. Mr. Hanohano is also the great grand-nephew of W.P. Leleiohoku.

5.0 Nature of Cultural Practices and Beliefs Affected by the Proposed Project

This section contains a discussion concerning the nature of the cultural practices and beliefs and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

5.1 The Cultural Setting In the Region of Influence

Document research and oral history interviews have not provided any oral tradition, legend, or cultural activity associated with the preferred ocean lease site in Kohala off Malae Point in particular. There are no resources within the ROI that are listed on the NRHP (NPS 2007).

Interviews with kupuna fishermen noted, and bathymetric charts confirm, that there is no underwater feature in the area of the ocean lease site that would serve to attract fish (Akau 2008, La`au 2008, Cambra 2008, Fukuyama 2008). They confirmed that in this part of the ocean, the cultural resources and practices of trolling, `ōpelu fishing, bottom fishing, and shoreline harvesting were all concentrated in coastal waters within 1 to 2 miles from the shoreline. (Akau 2008, La`au 2008, Ho`opai 2008, Richards 2008). Cultural activities today are a modern reflection of the same cultural activities of ancient times, including fishing in the coastal waters, and from the shoreline. `Ōpelu koa were well known to the master fishermen, who tended these ko`a to prepare the fish for harvest during its proper season. Interviewees noted that there were `ōpelu ko`a fishing grounds all along this part of the coast, within ½ mile from shore at locations close to Waiakailio Bay, all along the Red Hill (Pu`u Ulaula) area to Black Point (Malae Point), and Waiwaionū Bay at Puanui, and beyond to Keaweula Bay all the way to Mahukona (Akau 2008 and La`au 2008).

In addition to the `ōpelu, fishermen would also troll along the 30 – 40 fathom contour for ono, or other target species (Akau 2008, La`au 2008, Ho`opai 2008, Richards 2008). Fishermen would also fish for aku, during its proper season. And fishermen would also target onaga and other bottom fish (La`au 2008, Cambra 2008, Fukuyama 2008). These `ōpelu ko`a are very important natural and cultural resources and could be considered as an Area of Traditional Importance or ATI. They are located over two miles away from the proposed ocean lease site. The ono and mahi trolling lane may be considered an Area of Traditional Importance since Hawaiians trolled in this manner in prehistoric and historic times. A third type of fishery that is closeby to the Proposed Action site is the bottom fish fishery. Bottom fishing extended out to about the 150-160 fathoms, or about one mile from the Proposed Action site (Fukuyama 2008). Bottom fishing grounds may also be considered an ATI since bottomfishing was a well established native Hawaiian fishery from prehistoric and historic times.

Even though the 1873 and 1878 Boundary Review Commission records noted konohiki fishing rights for Ki`iokalani ahupua`a, Puanui ahupua`a, and Kehena ahupua`a, a review of copies of records compiled by the office of the Territorial Surveyor of all registered fisheries provided in Kosaki (1954) shows that no exclusive fisheries were registered in this area of North Kohala. If the fishery was not registered, then, according to *Bishop. v. Mahiko*, the right became invalid. (Kosaki 1954). Therefore, it is assumed that there are no konohiki fishing rights in this area of ocean adjacent to the Proposed Action site.

To provide some cultural context for the preferred ocean lease site offshore Malae Point, this analysis looked to the land closest and due west of the ocean lease site for information. There are numerous remains of historic dwelling sites found along the shoreline at several sites dispersed along the Pu`u Ulaula region as described above.

In the 2005 study completed by UH-DURP entitled: *North Kohala Coastal Cultural Resource and Heritage Landscape Study* reviewed all the archeological surveys of leeward Kohala coastal area. This information has been incorporated into this report. There were no protective buffer zones recommended at Malae Point for historic site protection.

Along the shoreline is a section of the Ala Kahakai National Historical Trail, that connects ancient and modern trails along the shoreline and mauka-makai. The Ala Kahakai National Historical Trail recognizes the significance of the coastal trail and its corridor as a cultural resource that shaped the Hawaiian culture. While the Pu'u Ulaula area of North Kohala is included in the designated Trail system, it is outside the priority area for implementing the 15 year planning period for all alternatives in their recent *Draft Comprehensive Management Plan and Environmental Impact Statement* (AKNHT-NPS 2007, p. 5) Maps in this document showing the North Kohala region of the Trail note that the land in the Pu'u Ulaula area is government owned land, except for Ki'iokalani. The map names the area "Kahuā Ranch, Ponoholo Ranch (Malae Point), and indicates there was a possible lateral trail along this coastline (AKNHT - NPS, 2007, p. 99). There is a trail that goes mauka-makai in the Ki'iokalani ahupua`a, and a partial coastal trail along the shoreline (Stevens 1994 in DURP 2005)

The shoreline is used for camping, fishing, gathering for recreational, subsistence, and cultural purposes (Ho`opai 2008), (Hanohano, personal communication). The coastal waters are used for 'opelu fishing, and trolling for mahi and ono, and bottomfishing for onaga and other bottomfish. A primary cultural value that was stated by the Ho'opai 'ohana and shared by Monty Richards, Pono Von Holt, Robert Cambra, Kwanji Fukuyama, William Akau and Lala La'au is to take care of nature and it'll take care of you. Bernard Ho'opai said, "You have to take care of nature and it'll take care of you. You need to give back. The more you give back, the more it'll take care of you." (Ho`opai 2008). Similar statements can be seen in Richards (2008), Cambra (2008), Fukuyama (2008), Akau (2008) and La`au (2008).

5.2 Potential for Unknown Resources,

Based on historical document research, oral history interviews, and observational surveys, there is no documentation or memory of existing or possible cultural resources in the Region of Influence (ROI). Nonetheless, it is possible, though highly unlikely, that future surveys and research may reveal their presence, at which point further studies and documentation may be undertaken.

6.0 Confidential Information.

This section contains any information or explanation of confidential information that has been withheld from public disclosure in the assessment. There was no confidential information provided to the author.

7.0. Conflicting Information

This section contains a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs. There was agreement among those associated with the coastal lands, that there would be no negative impact of the proposed operation on cultural activities and resources on land and the coastal waters they used. There was agreement on the location of cultural resources, such as 'opelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from nearshore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘ōpelu, but that it would not have a permanent affect on the ‘ōpelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono. However, other interviewees disagreed and warned that the Oceanspheres would have a negative impact on bottomfishing.

There was disagreement and conflicting information presented about the potentially positive or negative impact of the proposed operation acting as a fish aggregating device. Each of these individuals have their own perspective on cultural practices and cultural resources. These opinions do disagree. All of these ideas and opinions are presented in this report.

8.0 An analysis of the potential effect of the proposed action

This section presents an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources or practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

8.1 Potential impacts of proposed action on cultural resources, practices or beliefs in the ocean lease site

This section presents an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the Proposed Action to isolate cultural resources or practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

No prehistoric or historic cultural resources have been identified in the Proposed Action ocean lease site as eligible or listed as a nomination to the National Register of Historic Places (NRHP). Document research and oral history interviews have not provided any oral tradition, legend, or cultural activity associated with the preferred Kohala ocean lease site in particular. The site is far offshore and interviewees have noted that it is not used specifically for trolling, net fishing, bottom fishing, or other cultural practice (Cambra 2008, Fukuyama 2008, La‘au 2008). The area may be used by fishermen trolling from the nearshore ono lane to offshore fishing grounds. There are no historical documents of any official registered konohiki fishing rights in the area. Interviews with kūpuna fishermen noted, and bathymetric charts confirm, that there is no underwater feature in the area of the ocean lease site that would serve to attract fish (La‘au 2008, Akau 2008).

8.2 Potential impacts of proposed action on cultural resources, practices or beliefs in the adjacent ocean area surrounding ocean lease site

In the ocean area adjacent to the proposed ocean lease site, cultural activities today are a modern reflection of the same cultural activities of ancient times, including fishing in the coastal waters, and from the shoreline adjacent to the Proposed Action site. ‘Ōpelu ko‘a were well known to the master fishermen, who tended these ko‘a to prepare the fish for harvest during its proper season. Interviewees noted that there were ‘ōpelu ko‘a fishing grounds all along this part of the coast including Waiakailio Bay, Red Hill (Pu‘u Ulaula) and Black Point (Malae Point).

These 'ōpelu ko'a are very important natural and cultural resources and could be considered as an ATI. The ko'a are located over two miles away from the proposed ocean lease site. Two 'ōpelu fishermen said they did not expect there to be any affect of the proposed aquaculture operation on the 'ōpelu ko'a (La'au 2008 and Cambra 2008). Other fishermen thought that there might be some affect on 'ōpelu migration patterns (Fukuyama 2008).

Interviewees with master fishermen in the area noted that there were no 'ōpelu ko'a at the proposed ocean lease site, but there were ko'a about two miles from the site, located within ½ mile from the shoreline along the Pu'u Ulaula area. Two fishermen expressed a concern that the FADs caused 'ōpelu to gather away from the ko'a (Paulo, in Maly 2003: 293 and Fukuyama 2008). However, others felt that the distance from shore, as well as the depth of the waters in the area of the proposed ocean lease site would result in less potential to cause anything other than temporary effects on the behavior of nearshore fisheries, like 'ōpelu (La'au 2008 and Cambra 2008).

This concern was evaluated by analyzing the data from the closest comparable in Hawai'i, the Cates International, Inc. moi farm off Oahu. The farm site is about 2 miles offshore, but in shallower waters than the proposed ocean lease site off Kohala. Fishermen on Oahu originally expressed opposition to the establishment of the fish farm; now however, they are reportedly very supportive of its presence (KBWF 2003). The 'ōpelu fishermen, particular, have reacted positively to the farm's presence, because of the benefits that it has brought in terms of increased catches and regularity of catches. Evidence from the Ewa Beach fish platform is that 'ōpelu may be attracted to the platform for some periods, but that the schools still do move up and down the coast (Cates 2003). While it is unknown whether there is any change in the overall abundance of 'ōpelu, or rather only in distribution, the platform will probably not exclude 'ōpelu from the 'ōpelu ko'a, located over two miles away from the platforms.

In addition to the 'ōpelu, fishermen troll for mahimahi and ono, and target bottom fish in the fishing grounds in an area limited to the coastal waters between Puako and Mahukona (Cambra 2008, and Fukuyama 2008). Fishermen would troll along the 30 – 40 fathom contour for ono, mahimahi or other target species, which places the trolling lanes over two miles from the proposed ocean lease site. Bottom fishing for onaga in the area of the ocean lease site extends out to 150 fathoms, which places the closest bottom fishing area about one mile from the proposed ocean lease site (Fukuyama 2008).

Bottom-fishing season opened in November 2008. During bottom fishing season, an increased number of boats bottom-fishing is expected out to 140-150 fathoms (Fukuyama 2008). When these fishermen are not bottom-fishing, they may be trolling for ono and mahimahi along the 30-40 fathom line parallel to shore. With all these changes one fishermen summarized the situation saying, "the fishing is hard - there are plenty fishermen now, more fishermen than fish - the area is kinda almost wiped out" (Fukuyama 2008)

Among the interviewees, there was agreement on the location of cultural resources, such as 'ōpelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'ōpelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from nearshore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'ōpelu, but that it would not have a permanent affect on the 'ōpelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the

platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono.

However, other interviewees warned of a potential negative impact on bottomfishing (Cambra 2008, and Fukuyama 2008). There was concern that the proposed aquaculture operation would interrupt the migratory patterns of bottom fish, as well as mahi and ono (Fukuyama 2008). This concern was based in part on the assumption that some food will escape the cages and attract fish. For bottomfish, it was assumed this excess feed or waste would make it to the bottom (Fukuyama).

Fukuyama warned that the Oceanspheres would attract the bottomfish away from their usual grounds because of the smell and bits of food that would drift to the bottom. He predicted there would be more sharks in the area, which would mean more shark predation on bottom fish and, in his words, “It will be the end of bottom fishing in this area” (Fukuyama 2008).

The Hawaii Oceanic Technology Inc. information describes that no waste or excess feed will make it to the bottom (HOTI EISPN 2008), as a way to mitigate the potential negative impact its operations may have on bottomfish.

While this concern was expressed, it was also expressed that no one was really sure if it was going to have a positive or negative impact until the aquaculture operation is established. Everyone agreed that there would have to be some monitoring to see if it’s having an impact or not, and continuing dialog with the fishing community.

There was also concern that the proposed aquaculture farm might attract more sharks to the area with the increase in the number of fish around the cages (Akau 2008, Fukuyama 2008, Cambra 2008). Bottom fishermen expressed concern about this increase in sharks and its negative effect on their fishery. A specific concern was that more sharks will eat more bottomfish, as well as steal the catch off the fishing lines (Fukuyama 2008). To Hawaiians, the shark is a sacred animal, and is considered a member of their ohana. When developing the shark management plan for the aquaculture farm, it would be important make sure that measures to keep the sharks away from working divers must be culturally appropriate.

The presence of the open ocean aquaculture platforms would likely reduce access to areas that fishermen would otherwise have had open access to in the past.

8.3 Potential impacts of proposed action on cultural resources, practices or beliefs on the adjacent land

To determine how the proposed activity might affect the traditional cultural values and practices associated with the adjacent land area, twelve ahupua‘a in the area were researched in the area locally known as Pu‘u ulaula (Pahinahina to Kaihooa) and Black Point (Malae Point) (Ki‘iokalani, Puaiki and Puanui), including identifying and contacting all the known and identified cultural practitioners and kupuna, local landowners or long-term lessees, the recognized konohiki of the area and the native Hawaiian families culturally attached to the land.

For the interviewees who camped and shorefished along the shoreline adjacent to the proposed site, they were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews, each of them said it wouldn’t affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the viewshed

from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho'opai 2008, Hanohano 2008).

A primary cultural value that was stated by the Ho'opai 'ohana and shared by other interviewees is: "You have to take care of nature and it'll take care of you. You need to give back. The more you give back, the more it'll take care of you." (Ho'opai 2008). Bernard Ho'opai encouraged the aquaculture farm to give back to the environment and community.

Cultural practitioners and kama'āina with multi-generational connections to the land on the adjacent shoreline also noted no positive or negative impact of the proposed action on their activities (Ho'opai 2008, Hanohano 2008, Akau 2008, Von Holt 2008, Richards 2008).

Interviewees also noted that there may be some positive impact of the proposed project as a modern example of stewardship of the ocean showing how technology is helping provide fish from the sea, now that the fishing stocks have been depleted (Ho'opai 2008, Von Holt 2008, Richards 2008).

Even though this was not expressed by the interviewees, other Native Hawaiian individuals and groups could perceive that the presence of this industry, the Oceanspheres, the increased level of activity, the navigation lights and buoys may contribute to or diminish the connection with their ancestors and disrupt the balance of Native Hawaiian areas of traditional importance.

8.4 Summary of Conclusions Regarding Potential Impact of Proposed Action

Based on the analysis above, the proposed aquaculture farm at the ocean lease site offshore Malae Point is not specifically targeted for any cultural activities relating to fishing. The proposed ocean lease site may be used in transit by fishermen trolling from nearshore waters to go to offshore fishing areas for trolling.

The presence of the open ocean aquaculture platforms would likely reduce access to areas that fishermen would otherwise have had open access to in the past. There are no historical buildings or documented archeological resources within the proposed ocean lease site. The exclusive control over the waters (and the fish) inside the Oceanspheres is consistent with traditional and cultural practices that identified fish traps or lobster traps - and the animals therein - as the private property of the trap owner. The same principles would apply here.

The proposed ocean lease site is located over two miles from the areas targeted for nearshore fishing, including 'ōpelu and trolling. The proposed ocean lease site is located about one mile from the deepest depth targeted for bottom fishing.

Fukuyama warned that the Oceanspheres would attract the bottomfish away from their usual grounds because of the smell and bits of food that would drift to the bottom. He predicted this would increase shark predation on bottom fish and, in his words, "It will be the end of bottom fishing in this area" (Fukuyama 2008).

While this concern was expressed, it was also expressed that no one was really sure if it was going to have a positive or negative impact until the aquaculture operation is established. Everyone agreed that there would have to be some monitoring of fisheries to see if it's having an impact or not.

The Hawaii Oceanic Technology Inc. did a Zone of Mixing analysis and oceanographic analysis that indicated no waste or excess feed will make it to the bottom of the 1,320' deep ocean (HOTI EISPN 2008). This will prevent any additional food to attract bottomfish to the area. Nonetheless, it will be important for the company to maintain an ongoing dialog with the bottomfish fishermen to monitor changes in the catch rates or patterns, as a way to make sure that the potential negative impact on bottomfish can be mitigated.

There was also concern that the proposed aquaculture farm might attract more sharks to the area with the increase in the number of fish around the cages (Akau 2008, Fukuyama 2008, Cambra 2008). Bottom fishermen expressed concern about this increase in sharks and its negative effect on their fishery. A specific concern was that more sharks will eat more bottomfish, as well as steal the catch off the fishing lines (Fukuyama 2008).

To Hawaiians, the shark is a sacred animal, and is considered a member of their ohana. When developing the shark management plan for the aquaculture farm, it would be important make sure that measures to keep the sharks away from working divers must be culturally appropriate.

Cultural practitioners and kama'āina with multi-generational connections to the coastal land on the adjacent shoreline also noted no positive or negative impact of the proposed action on their activities (Ho'opai 2008, Hanohano 2008, Akau 2008, Von Holt 2008, Richards 2008).

Interviewees also noted that there may be some positive impact of the proposed project as a modern example of stewardship of the ocean showing how technology is helping provide fish from the sea, now that the fishing stocks have been depleted (Ho'opai 2008, Von Holt 2008, Richards 2008).

There were requests for the company to give back to the environment and the community in some way. Many said that fishermen should be able to fish around the Oceanspheres. Others suggested that the company release some fish into the wild.

The HOTI EISPN notes that the company will allow fishermen to fish around the Oceanspheres, just not above them or below them (HOTI EISPN 2008). This will allow local fishermen to benefit from the additional fish attracted to the Oceanspheres.

Even though it was not expressed by the interviewees, it is possible that other Native Hawaiian groups could perceive that the presence of the ocean platforms, the increased level of activity, the navigation lights and buoys may contribute to or diminish the connection with their ancestors and disrupt the balance of Native Hawaiian areas of traditional importance.

Based on all this input, it is concluded that there would be no significant impacts to cultural resources, practices or beliefs in the proposed ocean lease area off Malae Point, or in the surrounding ocean in the Kohala area.

9.0 Limited Cultural Impact Assessment of Alternative Site off Keāhole Point in Kona

Hawaii Oceanic Technology requested that as part of this report on the cultural impacts for the proposed ocean lease site off Malae Point in North Kohala, that the study include a limited review of the available oral history resources regarding an alternative ocean lease site that was considered and not selected as the proposed site. This alternative site is located about 2.6 nautical miles west of Keāhole Point in North Kona.

There are no historical buildings or documented archeological resources listed in the National Historic Register Places (NPS 2008) within the Region of Influence including the one square kilometer alternative site west of Keāhole Point, and the area used by the operation at Kawaihae Commercial Harbor.

To understand the cultural resources and potential impacts on these cultural resources in the Alternative site off Keahole Point in Kona, this study reviewed transcripts from previously conducted interviews including: George Kahananui, Lily Ha‘anio-Kong, Peter Park, Robert Punihaole and Valentine Ako, that were conducted by Kepa Maly and included in Maly, Kepa and Onaona Maly, *Ka Hana Lawai‘a A Me Na Ko‘a O Na Kai ‘Ewalu, A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands*, prepared for The Nature Conservancy in 2003.

In addition, this study reviewed the notes from meetings of Kona Blue Water Farms with Kekaha kūpuna regarding the concept of the proposed open ocean fish farm, which were used to obtain input on traditional perspectives and cultural issues with specific reference to open ocean aquaculture. (KBWF 2002).

9.1 Cultural Resource Summary for Alternative Site off Keāhole Point, and adjacent shoreline area:

The coastal lands on the shore closest to the alternative site are the lands of Kalaoa and ‘O‘oma, which are both part of the broader coastal region called Kekaha.

In prehistoric and historic times, there were numerous fishing communities that lived along the coast, including one at Ho‘ona (now a Historic Reserve) at Kalaoa near Keāhole Point, Wawaloli and ‘O‘oma to the south. Additional habitation sites are found continuing south through Kohanaiki, Kaloko, Honokohau, all the way to Kailua.

The Journal of William Ellis in 1823 included a description of Kailua, the larger settlement several miles south of the Keāhole area in the following passage. While it is not specifically the same place, it does give one an indication of how the coast in this area was populated.

Kairua, though healthy and populous, is destitute of fresh water, except what is found in pools, or small streams, in the mountains, four or five miles from the shore. (p. 29) The houses, which are neat are generally built on the sea-shore, shaded with cocoa-nut and kou trees, which greatly enliven the scene. The environment was cultivated to a considerable extent; small gardens were seen among the barren rocks on which the houses are built, wherever soil could be found sufficient to nourish the sweet potato, the watermelon, or even a few plants of tobacco, and in many places these seemed to be growing literally in the fragments of lava, collected in small heaps around their roots.

The next morning, Messrs. Thurston, Goodrich and Harwood walked toward the mountains, to visit the high and cultivated parts of the district. After traveling over the lava for about a mile, the hollows in the rocks began to be filled with a light brown soil:

and about half a mile further, the surface was entirely covered with a rich mould, formed by decayed vegetable matter and decomposed lava. Here they enjoyed the agreeable shade of bread-fruit and 'ohia trees.... (p. 31)

The path now lay through a beautiful part of the country, quite a garden compared with that through which they had passed on first leaving the town. It was generally divided into small fields, about fifteen rods square, fenced with low stone walls, built with fragments of lava gathered from the surface of the enclosures. Those fields were planted with banana, sweet potatoes, mountain taro, paper mulberry plants, melons, and sugar-cane, which flourished luxuriantly in every direction... (Ellis 1963).

In Kona, the stories from fishing activity identified nearshore and offshore fisheries, including stories about 'ōpelu fishing, collection of opae ula for fishing (Ako, Valentin, et al, p. 52) and travel and trade between the makai fishermen and the mauka farmers within an ahupua'a or its neighbors.

George Kinoulu Kahananui, Sr. described 'ōpelu fishing in the North Kona area, shark fishing, nearshore fishing (Kahananui, George, p. 226- 238, etc..), especially the area between 'O'oma and Kaupulehu, which includes Keāhole, the lands of Kalaoa and Kekaha.

Walter Paulo described 'ōpelu fishing and the maintenance of the 'ōpelu ko'a. He notes in his interview that the 'ōpelu ko'a is "...maybe hundred to hundred fifty feet...I would say about a quarter mile offshore." (Paulo, pp. 291-292). Paulo describes the effect of Fish Aggregation buoys on 'ōpelu ko'a "You going to attract if you have a buoy there and you attach a netting like on it, it's to attract the small fishes. You are going to find 'ōpelu over there." But he also notes he is in favor of fish aggregating devices when asked what he thought of them: "It's very good provided you can find it. But they do attract, why they put it in that depth it attracts ono, it attracts mahimahi." (Paulo, p. 293). He also described various bottom fishing and the introduction of long line fishing in Kona. He described aku and 'ahi fisheries in the North Kona area and also discussed trolling for aku a mile or less offshore (p. 307) Paulo also talks of fishing for aku at the "hundred fathom ledge or fifty, this aku comes up." (Paulo, p.319). Kepa Maly notes in this interview

It is very interesting, in the old Hawaiian laws that you see in the traditions, and the stories of traveling great distances to go out and fish. The large canoes, mostly ali`i kinds of things. By 1839 when you see the laws that Kamehameha III enacted, and as they carried through in subsequent laws. They always reference going out as far as the malolo fishery and into the high seas beyond. You'll find just that wording, they talk about the 'apapa fishery, the kilohe'e, malolo, and the deep sea, the high seas. We know that there is a tradition of the kupuna making great use of the resources near and far" (Paulo, p. 319).

Paulo also reiterates a common Hawaiian cultural value: "You have to malama this aina. Because it takes care of you. And it is the same with the ocean and the ko'a i`a. Take care of them because they take care of you." (Paulo, p. 327).

Peter Park discusses the fisheries of the area near Keāhole (Kaloko – 'O'oma – Kalaoa area) and discussed limu collecting, nearshore fisheries, trade of fishermen with families of the uplands. (Park, pp. 373 – 390)

Valentine Ako speaks of fishing in Kona to depths of more than 1,000 feet for “maguro,” which he describes as “that’s the one goes up to fifteen hundred pounds.” (Ako, p. 422). He describes ‘ōpelu fishing close to shore, and marked the 41 fathom contour in an interview with Kepa Maly (Ako, p. 437). Ako discussed aku fishing far from shore. He notes they would go out twenty miles to find the aku to catch, (Ako, p. 425) Ako also spoke specifically of Keāhole and the currents faced in the waters by the point. (Ako, p. 425-426). He also spoke of fishing for ‘opakapaka, ehu and other species to depths of more than 900 feet. (Ako, p. 428) Ako spoke of going out to “The Keāhole lighthouse, about a mile outside of Keāhole lighthouse...These were our fishing grounds and beyond that. It all depends on the current..” (Ako, p. 430). Ako also criticized the Fish Aggregating Devices, and recommended getting rid of them. (Ako, p. 441-442). Ako discusses akule fishing in the nearshore area (Ako, p. 450-453) and fishing for other species in the nearshore area (Ako, pp. 457-469)

Robert Punihaole spoke of ‘ōpelu ko‘a being two or three hundred feet from shore (Punihaole, p. 529). He also spoke of going fishing far from the sight of land (Punihaole, p. 532). But, he also spoke of fishing in his youth being three or four miles offshore (Punihaole, p. 533). Punihaole spoke of the treacherous current at Keāhole (Punihaole, p. 533). He described the shoreline fishing as

It’s for the ohana, that’s food for the family. But when we go outside moana, it’s ‘ōpelu, aku, ulaula, opakapaa, all this water...Kukaula if you’re going for ‘ahi you go hundred twenty, hundred forty for ‘ahi. Fathoms....Hundred eighty fathoms. If you go for ‘ula‘ula, eighty fathoms. You go for ‘ahi holo, not the kind ‘ahi ‘ele‘ele is way down, hundred forty, hundred thirty fathoms. The ‘ahi holoholo, holo i waena, is forty fathoms. You go kaka drop forty fathoms. You start from thirty nothing, then you hit forty, you mark your line. As soon as the fish come up you huki up, put in the boat, you bait ‘em, put your kaka, let go the pohaku. You not going get a pohaku, you going get the ahi. (Punihaole, pp. 534-535).

Punihaole talked about trolling for aku (Punihaole, p. 535) in the deeper waters, and fishing for luhe`e and a variety of finfish in the nearshore waters. (Punihaole, p. 570)

Along the shoreline of Kekaha is a section of the Ala Kahakai National Historical Trail, that connects ancient and modern trails along the shoreline and mauka makai. The National Trail recognizes the significance of the coastal trail as a cultural resource that shaped the Hawaiian culture. The Keāhole Point area is designated as an area with “High Potential Cultural Sites and Complexes” and is described as follows: “Keāhole Point to Kaloko Ahupua‘a includes small clusters of permanent houses, associated graves, small heiau, and temporary shelters including Wawaloli - ‘O‘oma habitation cluster that exemplifies the ancient and historic periods (AKNHT-NPS 2007, p. 23)

9.2 Potential Impacts of Proposed Action on Cultural Resources in alternative ocean lease area and surrounding area:

Since there are no historical buildings or documented archeological resources listed in the National Historic Register Places (NPS 2008) for the alternative ocean lease area, the focus of potential impact is on cultural resources and practices, such as fishing.

Based on the analysis of these oral histories, it appears that there was much fishing in the Kona area taking place nearshore, within a mile from shore and mostly within ½ mile and along the shoreline. In addition, there were recognized fisheries in the deep water going to over 1000’ for ahi, 900’ for opakapaka and ehu (Ako p. 428). One interviewee mentioned fishing in his youth at three or four miles offshore. (Punihaole, p. 533) Beyond this distance, there were also fisheries for pelagic species or

bottom fish species in certain locations with submerged banks or current patterns. This pattern of use is reflected in modern fishing practices. Fishermen report that they fish all over the Keāhole Point area including out to deep water trolling in the area offshore North Kona at the 1000 fathom contour (Isaacs 2008, Rizutto 2007, Sylva 2008), which is located about three to four miles offshore.

Interviewees and cultural historians cited in the Kona Blue Water Farm Environmental Assessment noted that there were no ‘ōpelu ko‘a at the area of the Kona Blue Water Farm lease site (KBWF 2003, p. 68). Using this same information, as well as the data from Ako, Paulo, and others, it can be concluded that the closest ‘ōpelu ko‘a would be near the shoreline, located over two miles from the proposed alternative ocean lease site. This distance, as well as the depth of the waters in the area of the Alternative Lease site offshore Keāhole Point would result in very limited potential to affect the behavior of nearshore fisheries, like ‘ōpelu. Nonetheless, Walter Paulo was clear that even the FADs caused ‘ōpelu to gather away from the ko‘a (Paulo, p. 293) .

To evaluate this concern, the experience of the closest comparable site in Hawai‘i is the Cates International, Inc. moi farm off Oahu. The farm site is about 2 miles offshore, but in shallower waters than the proposed ocean lease site off Kohala. Fishermen on Oahu originally expressed opposition to the establishment of the fish farm; now however, they are reportedly very supportive of its presence (KBWF 2003). The ‘ōpelu fishermen, particular, have reacted positively to the farm’s presence, because of the benefits that it has brought in terms of increased catches and regularity of catches. Evidence from the `Ewa Beach fish platform is that ‘ōpelu may be attracted to the platform for some periods, but that the schools still do move up and down the coast (Cates 2003). While it is unknown whether there is any change in the overall abundance of ‘ōpelu, or rather only in distribution, the platform will probably not exclude ‘ōpelu from the ‘ōpelu ko‘a , located over two miles away from the platforms.

With this in mind, the alternative ocean lease site offshore Keāhole Point is not likely to result in any significant impact on the nearshore fisheries. However, operations at the ocean lease site may result in some conflict with trolling at this 1000 fathom depth contour. The presence of the aquaculture platforms would likely reduce access to areas that fishermen would otherwise had open access to in the past. Regular communication with trollers and fishing tournament organizers will help mitigate some of this negative impact. Fortunately, there is a very large expanse of ocean used for fishing in this area. Therefore, the impact on cultural activities and resources of one square kilometer is considered less than significant.

Based on this analysis, it is concluded that under Alternative 2, there would be less than significant impacts to Areas of Traditional Importance in the ocean lease area and surrounding ocean area in Kona. The presence of the platforms may result in a greater concentration of fish aggregating nearby the alternative site, which would have the potential beneficial result of increasing catches for fishermen in the area.

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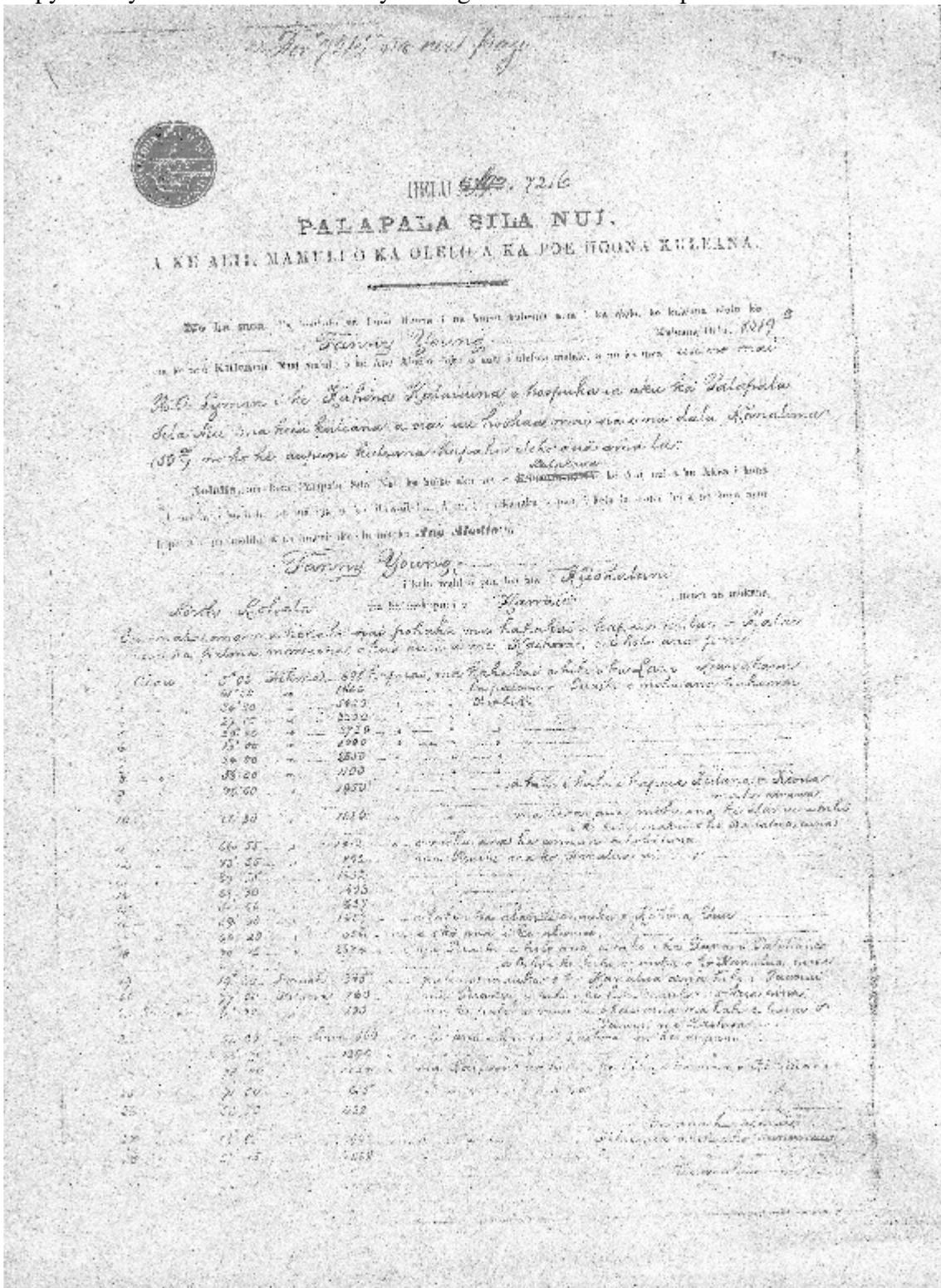
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11.0 APPENDIX A:

Copy of Royal Patent 7216 to Fanny Young for Ki'ioakalani ahupua'a



12.0 APPENDIX B

TRANSCRIPTS OF ORAL HISTORY INTERVIEWS:

Interview Transcription
William Akau
June 18, 2008

at Kawaihae with David Tarnas

DT: So I appreciate that today, let's see it's June 18, 2008. I'm here with William Akau. William Ahyou Akau.

WA: Chinese

DT: Well, that's it, you're a cosmopolitan man.

WA: My dad is Chinese-Hawaiian. My mom is Irish-Hawaiian. So we get a little of Chinese and a little of Irish. More Hawaiian.

DT: You've been able to make things grow here that most people would never be able to.

WA: Over here is all rock.

DT: No soil it's just all rock.

WA: That's why a lot of trees here never really grow here, it just all dried up. A lot of trees died already. The roots cannot penetrate down. It just kind of dries up.

DT: I guess that was the technique for growing on the coast in the makai dry area was to build up a mound of rock and then try to make a little bit of soil to grow things in because it couldn't grow anywhere else

WA: But if the weather it always cool and always have rain, no trouble, things going to grow. But over here the roots cannot penetrate down. Makes it hard. Waimea has a lot of dirt, alright to grow.

DT: Well, it looks like you've been keeping yourself healthy.

WA: Well I have to, no choice. Once a year or twice a year I go to Honolulu get my checkup. My doctors tell me if anything happens go here, but for the regular checkup down here cuz I had operation and all that all in Honolulu. We have a place in Honolulu, too, right in town right close to Queen's hospital. If anything happens we go down there and go right to the doctor there. There are a lot of specialist doctors too. Up here they're just general. They are going to refer you to this, might as well go to Honolulu, and get the check up.

DT: So your family goes back a long ways here in Kawaihae in this area.

WA: Yeah, goes back to... we are 5th generation. Me, my dad, my grandfather, my great grand father, my great great is Chinese. So that's how we started but then on the Hawaiian side we always been here.

DT: It's always been... what family was the Hawaiian family, what were the names?

WA: On the Akau side... We're supposed to go, our great grandfather, instead of going by Ching, we went Akau. So he dropped Ching off. All the Ching family in Kohala, all same family. So all Chinese-Hawaiian. Then my mom is from Kohala. She is half Irish and half Hawaiian. So all Hase family. They all moved out anyway, hardly any family in Kohala now.

DT: So you're one of the eldest in the Akau family here, because there are quite a few Akau's.

WA: Oh yeah, Waimea quite a bit.

DT: Andrew, Alex...

WA: Yeah, but Andrew them, Alex them ... they come from the second batch of my great grandfather. We came from the first marriage of our great grandfather. That's how it works, but we are still family. Only different mother.

DT: *(Describes proposal for open ocean aquaculture project).*

WA: Did they figure to put some samples in the ocean and do all the study to see how it works?

DT: They are doing the analysis of the currents right now. That's part of the environmental assessment they are doing right now.

WA: Ok. Cause if you go to Red Hill or Black Point, you can see that the current kicks it up. `Cause it whirls around and it goes back against the north current and then it starts whirling back again and goes south and then around... so it goes like that. So right here it's always active. The whole bottom because of the current it plays around there and then we go.

DT: What I'm interested in is what's your sense of the traditional and cultural uses of this area out here... this, in the ocean three miles offshore, from Malae Point?

WA: Get no idea what was there before. Only thing we know is how the current whirls within the bay. How that part, usually they always bang together, you get a drop current and then a sound, so they always...the action is always banging together. It's always going to be like that no matter what, you see. But in Kawaihae it's one way going, you see. In the middle is dead. So the thing that gets the top part of the ocean move it is the wind and the current from north hits south goes north and always like that . It's not going to come on the whole dead area. No, it always kicks out.

DT: So coming up from the south to Kawaihae, you have a current coming in here this way

WA: Inshore

DT: Inshore, coming up this way.

WA: It comes all the way from down Makalawena, goes out there, because the drop current hits the bank and then the action is down there, over, out, and in. Then it whirls in and goes up there where Black Point or beyond that, then it hits the current again, then it whirls over there, then it kicks out, move around.

DT: So it's coming north here... Black Point is over here

WA: Just passed where Kohala Ranch is, just beyond that...

DT: Just beyond Kohala Ranch. And so at that point, the current which is moving from the south to the north takes out.

WA: Hits what you call a drop current like that, they start fighting each other and whirling up there. And when they are fighting, when the south is stronger then they get in tune, the drop current go south and then they whirl around.

DT: The studies that are showing that right now, it's a really dynamic area out here, how the ocean moves. But I was trying to learn the uses of this deep area out here, in terms of fishing or gathering. I haven't found anybody that really uses that for fishing, they fish elsewhere, but not in this general area 3 miles offshore Malae.

WA: Usually in the April months you get the aku the ahi, all the things that coming in, so you find them within that area, south, goes north, some goes out, some just whirls within. It's a lot of feed too, that's why they hang around. Because if they go south in that area, they cannot live or survive in that dead area, because nothing there. So that's why they hang close around the edge of the current and move.

DT: Mostly is it nearshore... do you think most of the fishing activity is closer to shore?

WA: Oh say about quarter mile, half a mile off. It's good for handling deep sea. For weke and stuff like that it's about 35-40 fathoms. Then you go for kalekale and opakapaka about 60. Then ulaula is about 80, 90, all depends. Down there a lot of feed on the ground that's why it's an active area. Then you come Kawaihae, nothing.

DT: Do you know of any fishery that's targeted at the depth of about 220 fathoms, or in that general area, couple hundred fathoms, 200, 300 fathoms.

WA: You know University of Hawaii had those two ships that stayed here for months. From Kawaihae all the way up to what was Midway, So directionally, they go back and forth, hit Kawaihae. So they tell you, because the people use to come up, they used to talk story, some of them were family, they tell you in the boat they get a big glass cage with water running inside, it's all what they pick up outside in the deep. So what they say is because in the dead area, no circulation, so the fish... so they pick up all these little different species that you find along the shoreline. So the study they know what's what. Because you don't find that in other places, because the current just pushes away, because it's odor is dead, so they just hang around.

DT: Yeah, sort of a gyre. They just hang out right in that area. And the gyre will move, depending on...

WA: North, South. Because the seasons, winter months you get lot of storms and all that kind. The summer months quiet. You see those days we don't think about that we just go out fishing, we know this area is no good, we gotta go that area, because usually we go south or we go north. So out Black Point, around that area is good for wekeula. And you go little more, between Black Point and Mahukona, good. And you go further up and is good too but there is only thing: high surf.

DT: Past Mahukona.

WA: One time we got trouble there, we drifted all the way to Maui...

DT: Whoa!

WA: The engine was dead that's why. We anchored and fish would start biting, but the winds start coming, that's when the anchor came out. When I start the engine, I went down, so we put sail, try sail

back here, cannot, so we drift, drift then turn around. We went go down. When we go down, I went go rest, come back, then something tell me, the flywheel, get little holes on it, so we get the straight gap, stick 'em in, crank 'em. Won't start up, so we went to Maui. So fishing is good, but only thing, you gotta be careful because when the wind start blow, you better get ready to get out there.

DT: When you went north, so if you were heading from Kawaihae north, did you tend to stay close to shore? Basically as you were saying, the weke is 40 fathoms or even out to 90 fathoms, for the ulaula.

WA: Because the current, when the current is dead, you cannot fish. They're not around. The current gotta be really soft and pulling in a north or south. So that's where... sometimes go north, nothing, maybe south is better. All us guys south. You gotta be fast, when they're tired just come in. When they start really biting, gotta do all you can. When they stop, you gotta wait, gonna be long time before they start over again.

DT: Well mostly along the shoreline it's a south to north current. That's pretty steady.

WA: But sometimes strong. Your light cannot get down. Just stay on the surface. So this kinda stuff.

DT: When you would go out for ahi or aku, let's say in April, where would you tend to go?

WA: Up that area.

DT: Would you stay relatively close to shore or would you go further offshore?

WA: Oh, maybe about, say about 200 feet. Just not way out. You see the birds where they eat. When you see way out, means they are going with the current. Maybe current moving north, they going south, they going against the current. So you can see the birds whirling and moving, so you know they going over there. So no sense you go in. If the current is too strong, they going move anyway, because they cannot just cruise around because it's bad for them. If they swimming around and they go wrong direction, the water get into their gills and some of them maybe they get in trouble. So they always go with the current. Even when they feeding you can see them go up. They don't go this way, they don't turn around and face their back in the current at all. Always face head into current. So you can see that, and you can see how the birds go. When you see that you know they are going. You cannot do nothing. You see the birds they whirl and whirling. Sometimes they not on top but they underneath, but the birds can see them moving.

DT: Well I took your advice and I did go talk to Monty Richards about this, because it is that ahupua'a. He said, "I guess I am the konohiki."

WA: That's right!

DT: And I talked to him about the project and he thought it was a good idea.

WA: Good you talked to him. No sense put them on the side because they the land owner and they kama'aina. Work together. Make them feel good, you feel good, everbody feel good. But if you shut them off, trouble.

DT: Well I talked to Pono, as well. I was talking to Pono and Angie. Because Pono, they are close to Kahua, right?

WA: Their part is more to Mahukona side. I think Kahua is from more Kohala Ranch goes to Black Point or something like that.

DT: Pono told me that right at Malae is where they both have land. And I was able to talk to both of them.

WA: Good to get the information on the history of the various places of where people used to live because over there, the ahupua'a is narrow, but because makau-makai, all the way up like that. You get all the way to what they call Pololu, that kind, where they set up, so Kahua goes to Mahukona, I think. Parker Ranch is mauka.

DT: And there is a little piece that is Kamehameha Schools, Bishop Estate, that is just a little north of Malae.

WA: Black Point

DT: There is a holua that Pono was telling me that Andrew Akau and a group are doing a project there, an educational project with kids to restore the holua that's located there. So Pono suggested that I get a hold of Andrew and talk to him about it, but I guess it is ali'i land in that area, so there is a settlement and they have a holua that they are going to restore right now.

WA: I went down there one time. We went looking around. Then right over there is Keawanui. A long bay.

DT: Keawanui right here, just north of Malae.

WA: Right

DT: And that's where I guess that holua is.

WA: Oh yeah, you go, there's a gate, I think goes in, you drive down and right on the top, people go in like that.

DT: I wonder did the holua go all the way into the water?

WA: That I don't know.

DT: I can talk to Andrew.

WA: Yeah. Talk to Andrew. They just point that thing out to me and I just said "Ohhhh". It's the first time I seen it.

DT: That's what Pono said. He never saw it before.

WA: Lucky somebody remembered.

DT: Yeah. What were the family names of the families that were in that area. You mentioned Kahua, the kama'aina families, Pono and Monty. Do you remember any other families from that area?

WA: Read the records of the landowners is going to be the only way you know whether they still around. I don't know.

DT: And Pono didn't know of any either, and he suggested we could do a title search to see if any other names. A lot of it is government land and then Kahua, some Pono Ranch and Bishop Estate. And he said that was their understanding of what, who was there. But I didn't know if there were any other families that are still around that were in that area, or if you knew of any.

WA: No, I don't know.

DT: That's what... They sold it to Kahua a long time ago.

WA: They like over there, where you start going to North Kohala, started from this end... Each ahupua'a is kinda narrow and long. Every other one has mauka-makai ala hele road that goes mauka-makai and then meet the ala loa, from here going south right up to where Puuhui from over there goes up and down to Pololu. So that's the mauka side. And then from makai, go mauka to Kawaihae Uka. You cannot cross over because the depth is deep so that's why you gotta go way up, way up then you get two runs of a stream that runs down. One from Kahua coming down, one from Kawaihae Uka. The they meet and get into what you call - Honako'a. So that's why a lot of farmers used to be mauka side Kawai Uka. My dad and grandfather and great grandfather... They all born up there, Kawaihae Uka. So that's why when you fly on the plane and you look down, you can see how it's blocked off, terraced. I was surprised to see that, you know its still there!

DT: Yeah. And that came down Honakoa.

WA: That's right.

DT: They join and came down out there.

WA: That's why Keawewai always running, the water. So the other one from Kahua I don't know too much about that one. So yeah, you talk to Monty, they the ones on the land now, it's their land.

DT: And they've given me a lot of good information. And when I talked to Pono, he also said there are some cowboys who have been using for a long time, Ho'opai. So I'm going to talk to them too.

WA: Well the cowboys are the ones who helped to build the ranch so they always close. One whole family. So its just the younger generation who went to school and went away and stay away. Just the older ones now, no place to go but stay home. Good you talk to both of them. Because if you talk to other people and bumbai they hear, they say, "What's going on?" You know, disrespect. If you talk to them everything, because no one else know about it, but they the top. Like us we only know a little bit on the ocean side. We used to fish about that area. But it's good fishing grounds, you know, that area. Because you come back from Mahukona, come this side, between Mahukona and Black Point, outside there, even you go bottom fishing, you go trolling, aku, never miss up there. Good area.

DT: But usually it's within 100 fathoms, shallower than 100 fathoms?

WA: Well, I never go way out, but it's a fish area because why would the people live down that area if it's the dead area? It's an active area.

DT: I was just trying to understand better if this project site is in the deeper water, they were hoping to avoid the area where there is fishing. The fishing, they figure, is closer to shore. They are three miles offshore and most of it is closer from what everyone says.

WA: Well you take the reef fish they go out to so many fathoms and pau, and then you get the bottom fishes outside, like kalekale and uku and all those other ones, they at certain depth, then you go onaga or oponui, they go deeper water, and beyond that I don't know. There be, well, the ahi usually come in shallow water, too. They whirl around, the aku come in. But bottomfish they stay put in area. Because you got the currents too. If the current too strong they cannot feed, so if get the high banks out there then they always have a protected area because current goes over.

DT: And then here there's not... it's pretty flat out here. You're at 198, 220, 222... it's just a flat area going out here for a long ways. So here's shallow: 30, 40, 60, 80 fathoms and then it hits about 100 fathoms, then to 200... and then it stays between 200, 300, slowly here to 400. So it's really quite gentle. So that's why they picked the site here, because its outside the main fishing grounds, because the main fishing grounds would be, from what we understood, were in closer to shore here in 100 fathoms or less.

WA: Closer inside is all reef, then bottomfish go out to something there, then outside is nothing. Maybe you get what you call fish move by the current, so if that.. feeding ground usually close to shore, you get piha, wehu, and all that. They're inshore.

DT: What do you think a project like this, where you have all these large cages underwater offshore in this area... Do you think it would cause interference with any traditional activities or cultural activities, having these cages offshore, from your perspective?

WA: Well nobody done that before, the Hawaiians didn't do that. They usually stay close where they can manage...outside because outside the current is too strong. You go out you only gotta drop one time. If you make it, you make it. If you don't make it, you gotta go two or three times because too deep. See that's what certain... was they go if they really want to get onaga, the one with the long tail, red snappers. Oponui is a little bit inside, the onaga is way out, deep as can be...

DT: About how deep is the onaga usually?

WA: Roughly about 200 feet.

DT: Ah.

WA: Beyond that, because there's no feeding area for them. Usually the shallow area is you get more feed. In the deeper area you just get water just going through, that's all. It's got cold water passing through. So to grow things you'd rather have things more on the cool side of the water, so things grow. If too warm, then just cool down. Well that's good you folks making study up there. Try out cages there. Not going to interfere with trolling boats and stuff like that?

DT: Well, that's the idea is that they are far enough offshore that they shouldn't interfere. That's why I'm asking you, being that if it's located out here, the trolling boats would tend to be, as you were saying, closer to shore, half-mile offshore. So that's why they picked it out here, so it wouldn't interfere with them. Who would you suggest that I go talk to about any of the fisherman who use it.

WA: Well the fishermen have an association, if I'm not mistaken. I'm not involved with those anymore. Before, with part of it used for our living, but then I retired. New generation come in. Whether they commercial fisherman or just plain fisherman, but it's good to talk to them...

DT: I will...

WA: Because if something they don't like, they going speak up. If it's better fish for everybody, hey why not? Because you gonna have fish all the time. Because they gonna feed them, so a lot of other things going come. If sharks and stuff will come around, that's another story... It's up to them to figure out what they can do. But other than that, if they do something, they'll work together with the commercial fisherman, the community... because if it's working. Like Kona Blue, I'm sure it's working. The one in Honolulu, I think they are all working.

DT: The one in Honolulu, the moi farm over there?

WA: It's working?

DT: Yep.

WA: So they gotta find place where it's more or less safe. If put equipment in the water, there's going be wash away or current just push it away... So they make all the study, is it safe, steady current, how fast they pulling, so over there is the place. Because I think if you go inside the water is not as cold, too warm, so that's why they pick that place because the current is always moving.

DT: Steady current. And that's what they need.

WA: Well you have to because if you have a house, and in the room you don't have a fan, you gonna sweat all the time.

DT: Stagnant...

WA: Yeah! (laugh)... So, that's good. How would that affect the pleasure boats and all that running around there. Would that create a problem for them?

DT: What we're looking at is the area that's right over the cages, we'd have buoys. So we'd ask the boats not to go over it, but anywhere outside is fine. It wouldn't interfere with the transit of vessels, it would just be an area that would be here so that's part of what we are doing in the EA is looking at, where is the traffic in this area?

WA: Mostly up here.

DT: The traffic is closer to shore?

WA: Yeah.

DT: And then the barge comes in offshore. So we've got the vessels trolling and pleasure craft going closer to shore, all of them within one mile.

WA: Yeah, that's right.

DT: And then the barges that are about 6 miles. So this area is right in between. So far, from what we have learned is that it should be out of the way.

WA: Once you get everything all approved and set, then everybody know what's there. If you just go and drop something there that nobody know, then they get into trouble. But it's good.

DT: Sure, they'll have to get talking and making sure that everyone knows. And I will talk to the fisherman's association here.

WA: From where they going to operate from, Mahukona to that area?

DT: Kawaihae

WA: From Kawaihae going move up?

DT: Kawaihae commercial harbor. So they talked to Ian Birnie and made sure there was space in there for them and for their operation and so they would come out of Kawaihae, come up to Malae to the farm to work, and then back to Kawaihae. So that would be the idea. The only shore-based operation is Kawaihae.

WA: I wonder if it is the same outfit I know some time back... They wanted to use the warehouse, but somebody is in there now. I don't know if it got going.

DT: Oh, you mean the onshore operation here, the warehouse?

WA: Yeah, right inside the warehouse. See somebody is fixing it up, and that's why lot of things that took place there they had to move out. Because there's two building over there... the old one and then the new one. I think somebody already have one, I think. And then this one down here they going take them down.

DT: So they'll have to work with Ian Biernie to make sure they've got their place. They've talked to him already. Ian said there was sufficient space for them. So that's the idea. The shore-based operation would be in Kawaihae Commercial Harbor, go service the cages up here off Malae, and then back to Kawaihae. That would be the only harbor so they wouldn't use Mahukona, just Kawaihae.

WA: But you don't know the best place, if they can't work it out. If Keawanui, a deep bay. It's right next to Kamehameha Schools propoerty. Over there is good. It's a safe place. It goes up quite far outside. They can dredge inside and make nice piers and stuff like that, where you can go check the cages and then come back in instead of travel from Kawaihae up there... But they still can make a road that you can make a ramp and still use boats to go check these things out.

DT: That's a good idea.

WA: Much cheaper that way.

DT: A lot closer...

WA: Yeah, because you wouldn't want to check, but when you going to do the real thing, harvest it, all that, then or something else... You need a bigger boat to take all what you can and then bring it in and go through the whole process.

DT: Well, that's a good suggestion. I'll keep that in mind. I was noticing when I was out there that people use the shoreline now for camping, for shoreline fishing... that's primary use of the area there.

WA: Well you see that's the state, Land and Natural Resources, the Fish and Game you might say... They're supposed to put signs and all that, tell the people, but you don't see any signs and people just go and do what they want to do and you get all paddleboards and stuff like that... they go all over. They're supposed to keep the reef in top shape, don't interfere with the growth of the reef fish. But you get all that back and forth, back and forth. What the state is doing, they're not doing their job, they are to protect the natural resources of the island. So when it's time for harvest, harvest. When it's time for rest, rest. See that these things are in place, but now you get all kind stuff going on. It's kinda hard. Just like now if you folks going put that, if you get lot of people going up there running their craft in and outta there, it's not good. It's gotta be in order because the state is allowing you folks to do that. Ok, you folks have the right, so the state should do something about all the commercial fisherman, the private fisherman who go in that area, and keep out of this kind area, keep off the shallow reef, or doing this kinda thing... no one doing that, so you go look the shoreline and what you used to see in the past so plentiful, now there's nothing... Just like right by the heiau go down... Every season, the mating season, the spawning season, all that. Then when they start spawning, all the young ones come in, and they grow up, and then at certain size, then they move on. It's the thing that rotates year after year. But see today they don't see that, they don't protect that. So what we gonna have tomorrow, nothing. You look Pelekane, they all coming up. So it's really hard. Because if you don't... just like the 'ahi... if you don't take care of the 'ahi, that they come in, spawning and all that, how can they come back in? No more. So that's why everybody's supposed to work together. It's everybody's benefit, not one person.

DT: What's your sense of... or what's your perspective on this open-ocean aquaculture? You know we've got the project in Kona, the project on Oahu, and now this proposed project here. What's your perspective on it as a future activity for Hawaii?

WA: Well, some places is making a go of it, some countries. Because this thing they not just start here... they start in other countries. In Japan they really progress here on it. So if it's worked there, why can't it work here? So we gotta try. So that's what this is all about. So you pick the spot, so you figure that's the best place to start. So where else can you go next, that is future. If this thing works good here, then you have other places you can go.

DT: That's it. We've got to give it a try. And that's really going to be a pilot project here just to make sure that it works. And then if it can work, we'll show that it works and then we can do it other places here.

WA: But you take Kona, then it goes all the way down... So much things going on, kinda hard... Over here, lucky, not that much now, but then we get too much hotels... all the golf course fertilizers get in the ocean, so that's the state's responsibility.

DT: If you look at the land use mauka of Malae, it's all area that is Kahua and that's their place primarily.

WA: That's right. Is no development... only Kahua have Kohala Ranch that's the only place. Pono has no development in his area. Because you take Kohala, Kohala is going down. People is moving out, so even if they put some kind of thing in there, property, how you going to get the workers. The workers around, so to start off you have nothing, so better stick to ranching.

DT: Any last advice you want to give to me or to the company as they're looking at doing this project?

WA: I'm sure they picked the right place. The wind is not as, that strong, you might say. Because that's where most of the fishermen, know better where on this island, when they headed down to Kawaihae, they head up this direction. They don't head all the way to Mahukona but right between Mahukona and Kawaihae, so that seems to be best area for fishing, so that's why you folks choose that area, because everything is there, because they can put the cage and grow those things. But it would help out all this other fishermen because the feed will always go and other fish will get hold of that and stick around and mill around those cages or whatever. You should think about the feed that they use is not going to just stay in there, it's going to wash through and so get out and the fish will constantly get the taste and the smell of it. They always will head that direction. When we go out, we go deep sea fishing, we always put palu in da kine. We always take out the palu, spread out, fish come in... the same thing. You gonna put something permanent in over there, fish always going to be go there. Whether you like it or not, they going there. They get feed. So that's the key thing. They putting up a cage not feeding the fish, don't make sense. And where they going put their headquarters, they already have a place?

DT: Well, if they get their ocean lease, they want to have their headquarters in Kawaihae Harbor here, and also use Hilo Harbor.

WA: They can ship them off in Hilo...

DT: That's right, they can fly them out of Hilo airport. Because I think they'll probably air freight them, once they're processed.

WA: You know Hilo was just like the king of fishing. Used to be choke fishing boats in Hilo. Then everything went down. Aku, couple aku boats there, loaded with aku. No more here. Same thing Kawaihae. But everything is there already, just people retired, move away, and then next generation doesn't care too much about going through that life, find something better. But it is important because that's what feeds the community as a whole... You have to have those kinda things... improve, make it better. Going out day and night fishing... this thing you trap and you feed them, you grow them...

DT: I was amazed to read the stories about the huge fishponds that Hawaiians had made in the Kona area, where they would actually capture the fish and then grow them out in the fishpond so it was like your freezer.

WA: Yes because the winter months, rough you cannot fish, so you have that... storage. Over there you get Kona, the all the way up the shoreline, there a lot. I remember Kalahuipua'a, they had about five fishponds. So every year during the spring, April, all the young ones come in and start growing up inside Pelekane, so we used to get to the side, we'd pick up, we'd load up on the boat, we'd drive them down, we'd stock the ponds. Every year you gotta do that because when you take out you gotta put back, that's how. And that's the style of the past. So you always gotta balance that things move on, everybody forgot about it. Even now I don't know where they bring in the new stock.

DT: I don't know... to stock the Kalahuipua'a pond? I don't know what they use to stock those ponds.

WA: Oh yeah, because before they used to get them here by the heiau. Every year come in. You cannot do the thing anymore. They gotta come from out in, start the process, lay their eggs and whatever, then it grows up and then put inside and move on.

DT: Yes

WA: So when it comes in, you take what you need, put in the pond, and the rest go out. Even in the whole coastline, the big kinda rivers that were on the side. But the old timers, they pass on and the younger generation say, "Ack, forget about it". But then when people come in, the study is very important. But see nobody been keep up so they have to start all over again. And then just like experiment, they gotta find the right answer to things. But you've got the past generation keep on carrying on so you don't have to. You could get information from them and move on. I used to do that every year. Go to Pelekane, load up the skiff, take them to pond. Then Parker Ranch used to do the same thing. My grandfather used to put the stuff in the pond right next to where we used to live. Then every year when Parker Ranch takes out the fish from Anaehoomalu for the party and stuff like that then they come here ready, so they transport this here over to the pond and they grew up. Then you came from the ocean, you raise it up again. But everything is on the shelf. Nothing cared for.

DT: So I guess this project is the next generation, where you're trying to cultivate the fish... It's an agriculture operation, really. And that's why Monty and Pono could relate to it because their ranching experience. This is sort of ranching in the ocean.

WA: That's right. Because everything is there now to bring them together because it's a seasonal thing... So the time is up, they move out-- you've got nothing. So if you going to raise them continuously, you will always have something, and that brings the outside reef fish closer to the cages with the feed. So all that is right to do a lot of things. Lotta people will disagree, but eh, lot of countries are doing it and it's working. Why can't we do it?

DT: It does work in other countries, that's true. And they've shown that it can work here, with the project in Kona and the project on Oahu.

WA: They already started, so you know. And plus the cold water from the bottom ocean and use all that, lotta things they did.

DT: Well this one will be unique just because it is out in deep water, so it isn't in any of the trolling areas. It's using technology that's been around but no one's applied it to a fish farm. Because they've been doing OTEC for years. And now they're going to apply it to this.

WA: Well they came across that...Using the cold water works. So same thing, you folks planning to do this and put it there, it works because other places is doing it. It's just that maybe it's too expensive and all that, you know, to put this thing together. But once you get them in place and that thing work out no problem.

DT: Some people have said just make sure you are nowhere near any fishing ko'a, and at 220 fathoms, there's nothing... what you've told me confirms what I've heard from others. Is that fishing is much closer to shore.

WA: Because it's just like... putting a bag of feed in that area, who you going feed? You going feed what's around there, but you folks' cages where they going pick certain ones and then raise them in the cages, yeah?

DT: We'd be actually raising ahi in a hatchery on land. They are actually going to just catch the brood stock ahi in Hawaiian waters, have them spawn, then grow the small fry to a certain size. Then take those out into the cages, and grow them out to market size.

WA: But that you can do in one year? So you really gotta have lots of eggs in order to...

DT: Well, they produce a lot of eggs in spawning, as they've learned in Panama, where they're doing a lot of work on this, and in Japan.

WA: Panama?

DT: Yeah, Panama's been doing a lot of work on the hatcheries for tuna.

WA: Yeah I know because twenty or thirty years ago we took a trip and went all through there.

DT: You did?

WA: When my dad and mom retired, we traveled all through South America, go Panama.

DT: That would have been an adventure.

WA: Well they already done it. So even though Hawaii isn't near where they do that in Panama, so now Hawaii is starting. But that's alright, because it works. It works. But the thing is too expensive if you don't have the backing. Then that's a problem, you see, finances. But if you have that, then the future is always there. So public still going eat 'ahi, so it makes it easy. You raise it, you sell it. Before you have to go in the wild and hunt for 'em deep down. Like in Hilo there're a lot of boats, but when the war stop and all that, everything went down. You don't see that no more. Kona the same thing. So 'ahi hasn't been brought in from this island. Kona, Hilo, nothing. Because everything, especially the old timers, most of the Japanese fishermen. They get old. Pau. Hang up. Their children wouldn't go back to do what they was doing. But that's life, so now they're starting up this. Maybe this is easier. Sitting there, feed it, grow up, harvest. But only thing you gotta be sure, the storm. That's the thing.

DT: There's plenty of risk.

WA: But if everything goes smooth, no trouble.

DT: You know because the fisheries... the stocks of the wild fish are depleted so much that if we're going to produce enough protein for the community and feed the community then we need some other way to do it.

WA: That's right. Well, as the world moves on all the little things start putting together and they start up experiments, most time it works. Japan had it, China had it. Only we didn't have it because we go out in the wild and harvest everything. But after all this taking, what have we? Nothing, you see. But if we raise it, grow it, we have something. Always. On storage.

DT: That's right.

WA: Because I'm sure they made a study of it and they agree that this is the place.

DT: They actually... the alternative site is in Kona, offshore Keahole, but it's a much busier place. Lots more activity there and potential for conflicts of use.

WA: Well you blame the state for not controlling it. You know if they put some kind of control on it, it'd be alright because when you get so many boats going back and forth, you disturb the growth of the shoreline, the fishes and stuff like that. You only busy watching, but you need to put that on the fish because that is food for you. But no they take the money and they do this, they do that. All the small kind paddling, the modern things going on, the kayaks. You go down here by the canoe club, loaded with that. Running on the reef, you know the reef is for the reef fish to live and to grow. That's food for the public. They only think for themselves. What they wanna do? They wanna exercise. What you can do, exercise somewhere else, where? They're there to show off! Show off...

DT: My exercise is doing chores at my house.

WA: Oh yeah.

DT: But you really have done just amazing here. Even though there's no soil here, what you've been able to grow.

WA: What can we do? We gotta get our place to live, to grow.

DT: Oh sure, make some of your own food, you got fruit trees.

WA: Well we used to live below. It was nice. Because of the development of Kawaihae, they all gotta get out there, so they said we move here, above the road here. But most of the people, wasn't the Hawaiians. They Chinese, Japanese. So they cannot get Hawaiian Homes land. So they pack up and leave.

DT: So is this Hawaiian Homes?

WA: All Hawaiian Homes. From the bridge up here, all the way goes to Kohala Ranch. It's all Hawaiian Homes, goes all the way up mauka. But Hawaiian Homes another thing. Too much restriction. You know a lot of people do a lot of talking, this, that. Oh you gotta do this, you gotta do that... they get confused and the first thing they say is, "Forget about it" and they just walk away.

DT: No it is a challenge... Well I'm glad that you're here. This is a good spot. You used to live makai of the road over here?

WA: Yeah, the road goes down into the harbor, where that...the house where the guard stay. Right over there's where our home was.

DT: That's where your home was.

WA: My grandfather bought it right by the fish mart. But it's all gone.

DT: Things change... Well, if it's ok, I'll come back and keep you posted on this project as it goes along.

WA: Give me a call. Yeah.

DT: Give you a call. Drop by. Good to come by in the morning when it's nice, cool.

WA: This is the thing: if it works elsewhere, it should here too. You gotta try.

DT: Step by step, gotta give it a try.

WA: That's right. You gonna be out that area anyway... So I think it's a good area.

DT: Yeah, step by step. We'll work on it.

Interview Transcription
Monty Richards
June 30, 2008

at Kahuā Ranch with David Tarnas

DT: Well, it's June 30th, last day of June, 2008.

MR: Yup, the last day of June.

DT: Last day of June and here we are in the summer of 2008 with Monty Richards up at beautiful Kahuā. (*David explains the project and the Cultural Impact Assessment to gather information about cultural resources and activities in the project area*). I first went to talk to Bill Akau, since he is the old man of the sea down Kawaihae. So I talked to him and he told me his stories about what he knows... Kawaihae, moving a little bit further north... But he said, "This area... well you gotta go talk to Monty. Monty's the konahiki." He said that.

MR: It's interesting because I am. We own the ahupua'a, all the way down, and actually we own three of them: Kahuānui, Kahuo'ili, and Waika, and so being, I guess, owning the upper part and all makes me the konohiki of the whole place, which is fine, that's alright. But anyway...

DT: Ki'ioikalani... You also own that ahupua'a.

MR: Yeah, and that was... if you'll notice, it comes up to the road here, and some of it was owned by some other members. The ones, the three that I quoted to you, we have Land Court title, to Kahuā. Ki'ioikalani we did not have Land Court title.

DT: The Land Court said Fanny Young...

MR: It was not a Land Court Award to Kahuā Ranch, so now it may have been Land Courted before, but at the time we... The reason you've got all these papers (referring to a land exchange with the state for Puaiki) was because: Number 1- the highway went through and so they had to do all of that, and then Number 2- we traded land to the State and one of the remnants that we got was that makai part of Puaiki. So then that had to be authorized and agreed and signed off by the State. Then we decided when Ponoholo and Kahuā each went our own way, which we don't go our own way, purely ownership... We decided alright, we'll put this together and we'll actually subdivide it so that all the percentages of all work out. Because there's nothing historical about this particular line.

DT: The line between Ki'ioikalani and Puaiki.

MR: That was jiggled so that we ended up with what we have.

DT: That was this realignment that you did here... where it was going this way and then slightly moved over. When was the... so this was in...

MR: '80s, or something. '81 or something like that.

DT: So that's when you did the separation.

MR: Yeah, and so the State already had given us this, and so that was all squared away but then all we wanted to do was actually, you know, to come up with... Kahuā is this side, Ponoholo is this side.

DT: What's your memory of Ki'ioikalani? Since that had been in Kahuā ownership for some time.

MR: When you see up until the last 20 years. Prior to the building of the Akoni Pule Hwy, that was just land. Bitch to get to. We had jeep roads down there, which people later claimed as old Hawaiian trails, which was malarkey. It was dry, dusty, hot, and we used to let fisherman go through from up here. They would drive all the way down to the beach. We worked with them.

DT: So they would come actually from mauka here.

MR: Yeah, before the highway. And they would drive down, so it was just land. People ask me what the land was used for, I would say, well the only thing I could figure out was its main job was to help to hold the world together. Other than that...

DT: So when did the ranch start using it for what it's being used for now, recreational purposes.

MR: Well after the road went through, all of a sudden it becomes available. And as beaches become fewer, both by land owners' ability to put up gates and the rest of the crap, and more people. Hey there are not many beaches on this island. Not that there's a beach down here. But we decided, Pono and I, that everybody started piling in and dumping all their trash, and all the rest, so that's why the place is fenced. To hell with them. So we use it for our people, our employees. We maintain peace, Pono maintains peace, we operate as one. Actually the camping site is here, on the Kahuā side, not that it matters they can camp anywhere they want. And they take guests, fine, let us know. So that's how we use that. Now I will caution you and point out to you that there's a stream, shows it here, but the stream does continue out into this bay, now if that runs water, fresh water... If you're three miles out with your cages, fine, how far that exudes out, I don't know. And I don't want to be put into a position, "Well, you must control the water." No. No, no. Because the State claims ownership to the water. The State can worry about. But that's the only thing I can point to that would, in any way, have any problem out there.

DT: How often have you seen this run in your lifetime?

MR: Oh, I've seen it run plenty... it runs fairly often. You'd have to go... because you see, right here, this is up above right here, and the stream does run.

DT: Does it run through Puaiki or Puanui?

MR: Puaiki.

DT: So it comes through your place at Puaiki.

MR: Yeah.

DT: And it empties into the bay right here.

MR: It can.

DT: That's good to know but it's an intermittent stream?

MR: It's a small intermittent stream and I wouldn't worry about it.

DT: But good to know... When I was talking to the Ho'opai family, Kimo was saying that sometimes he would use it, even before the road was put in, but it must have been very difficult to get there?

MR: It was a bitch. The ranch had, I'm trying to think... We had a road that would go here and it went all the way across. And we... the road would go across to Honakoa. But then, then you had to go back a ways, where we're able to get down to Honakoa, and then come up the other side, but all these other things, yeah I remember.

DT: Because that continues all along here...

MR: Yeah. That's right. Was there an ancient trail there at one time? Possibly, but I'm not that old. But an awful lot was cleaned up by bulldozers, our dozers. We kept it and that's...

DT: What do you have in terms of, this area right here... This is one big lease from the State...

MR: It was leased from the State. Pahinahina.

DT: So you would refer to this as the Pahinahina lease.

MR: Yep.

DT: And, how long has Kahuā had this lease from the State?

MR: I guess, I don't know, 1930? It's been a long time.

DT: And the Ki'iokalani parcel, ahupua'a, Kahuā had acquired...

MR: I'm not sure whether it was acquired from L.L. McCandless. I think he owned, or his people owned, a chunk of it. And that you can look up and see what it says...

DT: Yeah, I'll do that. In terms of the lease for it... you purchased it. Was there interest in acquiring this, because it was one available...

MR: I don't know because you take up here. Ki'iokalani is here.

DT: Ki'iokalani is here and then it stops.

MR: The reason it stops... you notice it doesn't stop here... This is where we exchanged for the State. Where we gave them all this land here for one down here and some of the State land up there. This was the first and until fairly recently, the only land exchange that went through the legislature. You'll find that this is the first... this is when the legislature was required to bless every exchange made by the State. We were the first to get through and we were probably one of the only to get through. I think you'd have a hell of a time right now.

DT: But this one actually went through, this land exchange in 1967, where this parcel was split up and in exchange with the State of Hawaii. So this was one of among several parcels that were exchanged?

MR: Yeah, up above, and this was part of it.

DT: So was this also having to do with the road?

MR: The road was already there, yeah.

DT: So the road was there... Do you remember when the road was put in?

MR: Uh uh. [No]

DT: I can find that out. When the road was put in, they needed to take land, basically from all these parcels, all these ahupua'a. Was that, did they do a land exchange for that how was that...?

MR: Now what Kahuā did... you've got the road here... Really a funny story. Boss was not, couldn't see this road... I always could. I always thought that it was needed if this island were to grow. And if you were to get value out of your land, then you had to have the work done. So we used to argue, not argue, discuss... The boss was Atherton Richards. Well, the thing was being roughed out and it started from Kawaihae. Of course all that's Hawaiian Homes Land. John Burns was the governor. We went finally, Alec Napier, my boss, gives me a call and says,

"Hey Junior... Got a call from the old man..."

"Oh yeah, what?"

He says, "What's Kahuā gonna do about their land. I mean how much they gonna charge for this. Gonna charge a lotta money too. To hell with them."

He's gonna stop the job. I knew he could. And I...

He says, "You know how the boss..."

MR: He says, "What do ya think?"

"Go tell the old man dollar."

He says, "You sure? Because you know probably going get fired."

"Yeah, that's okay, but in the long run for the island, it's needed. It must be done."

And he says, "Well okay".

He did it. And the boss came back, and I'm thinking, "Boy I'm getting my paycheck on the wall for this."

He said, "You thought it out?"

Yep.

"A reason for it?"

Same reason I gave you. I said that we're... Hawaii is changing. You've got to be ready to move. By doing this, the State is going to... you will have helped the State. Why? Because Parker... I mean all this other land is Parker... Parker's like this... And so the move's ours. So we went for a dollar a year. Now, let me tell you. Now time has moved, the road's gone in. When it comes time to exchange, you see the State fighting us? Came to this parcel down here.

DT: Puaiki?

MR: Right next door. Yeah, Puaiki.

I said, "Hey, the guys say you don't need that remnant. May as well take all of the State and the rest of the stuff. You see that?"

I said, "You give me that land, so I get a nice little tie-in piece."

You know what the State said? Yes. They take care of you if you took care of them and... There's a road on through and I said how many right of entries do you need? I don't know I'm not a land owner. Ok, we'll draw in five, six of them, something like that. This is way back down.

They said, "Tell you what we'll do... We just put 'em in now. When you sell land, or if you do, you're going to want to move 'em and that kinda stuff, no problem."

So the last one came up about three or four year ago. Do you know how the Department of Transportation operates now? You wanna move an easement, they come out, they appraise like this, and then you pay a bunch of money and they permit you to move it. Now Andrew Hayashida, they brought him out of retirement or something and they made him head of the Department of Transportation or whatever it was, if you remember for a short time. Well, once they were able to get through...

'Hey, Monty Richards here... Hey, my deal with your boss, John Burns, was this, this, this, this. And I'm here for the last time, the last one. We're gonna want it moved. It's going to cost too much, and everything else. "OK, see what I can do..." So it took a long time.

He said, "Monty, you may think I run the department. Bull. All the clerks down there do, but," he says, "I got it through."

DT: Wow, you have a lot of good will there.

MR: You try and you, when you give someone your word, you adhere to that. You don't forget and they won't forget. So I'm a Republican. I salute those guys. They stuck by their word, I always stuck by mine. And made it work. That's probably a lot more than you need to know.

DT: I'm very interested in that. It's true. This is an important piece that the State recognized that it was good to exchange to you. So this actually then became part of...

MR: It all became one Kahuā Ranch. That's the story behind it.

DT: So Puaiki mauka of the highway remains on State lease.

MR: Yeah, that's right. Puanui is Bishop Estate. Puaiki is State of Hawaii.

DT: And Kahuā has a lease on the Puaiki mauka of the highway?

MR: No we don't have anything.

DT: Does anyone?

MR: I don't know who has it. Damned if I know.

DT: So just this area here.

MR: Yeah. It's probably Parker.

DT: Well this says Kahuā, but maybe it's older.

MR: Yeah, but see...

DT: Oh, this is Ki'iokalani. Puaiki... Yep, Parker. You're right. So it's Parker. SO Parker, the next one, Puanui, is Bishop Estate.

MR: Bishop, that's right.

DT: And then, looks like all of these... There's some Land Court Award, and then there's the State.

MR: I'm not familiar with any of those...

DT: What's your memory, let's say before the road went in, pretty much this was Kahuā and this was Parker? And it was used for pasture when you could?

MR: Yeah. Bitch to drive.

DT: And not much water.

MR: Nope. You had to pipe water. It's the only way water gets down there, by pipeline.

DT: You brought a pipeline down into the Pahinahina lease?

MR: Yes.

DT: In terms of the use of the shoreline and the nearshore ocean, the ocean in front of here... What's your memory of it, in years past, and...

MR: Fishing. Yeah, people had to have a boat or a jeep or something to get down there. That's what kept a lot people out. Number 1, of course this day and age, people are lazy.

DT: So when you say fishing, what kind of fishing? I've heard stories of others who were describing it, I'm just interested if you have knowledge of any particular types.

MR: Not large commercially, if you look at today and all.

DT: Would they be relatively nearshore...

MR: Well, if they were trolling they're nearshore because the tradewinds, you know the further out you got, the more the trade you picked up. You were protected by the island on the inside.

DT: Most of the stories I hear from talking to Bill Akau, or even to the Ho'opai family, they're saying the activity is close to shore. There's shore fishing, gathering, shore casting. The opelu is close to shore, there's still some but it's all pretty close to shore, half mile out at most.

MR: Yeah.

DT: And then trolling... Bernard Ho'opai was saying in his estimate, they were averaging one mile offshore. Sometimes closer, but not much further.

MR: Probably right. No, I agree.

DT: Do you know of any stories connected with the land, this area.

MR: Well there wasn't really a lot that I... it was mainly fishing, that's all. Even hunting, you know, you never got, there were never pigs and all down here, it's dry. And the goats had not moved over there. There were no wild sheep.

DT: Looking at the archaeology, it looks like there's a string of different settlements along here, just small ones...

MR: 'Cause they had no water.

DT: That fits with what you know of it.

MR: Yeah. Had no water. Sure during winter time, some of the streams probably flowed down as this upper area was still forested, but there was no permanent type of stream. It was intermittent at best. And, let me call it fresh, but sure there were, there's water that remained in the pockets, but that's it.

DT: So your memory of what you've seen along the shoreline, how would you describe it, in terms of the old historical remains. What would you...?

MR: I'd say very little.

DT: So no stories connected with... I remembered stories up here connected with Kamehameha. Do you have any stories down makai?

MR: Down makai, there are a couple places, burial caves. And that's about all. And in those days, I'd been in a few of them. But I wanted no part of them after a while. Let those folks, let them sleep, and I wouldn't go in any anymore. But this whole country down here... Some people try to make it this, that, and the other. Bull. It was dry, it was part of the island, that's it.

DT: Was there any stories that you remember in your own life, that you particularly connect to this area. Stories with importance to Kahuā or this area?

MR: Ok, the only story that I know, that I can remember, was that I would get a phone call from the police of a tidal wave. Usually around 2 o'clock in the morning, and so Christ, get in your truck...

DT: And this is what time period, you're thinking?

MR: Let's see. In about the late '50s early '60s. And they say, "Monty we get tidal wave alert." You know in those days you think, tidal wave alert is not much now, you should know those days. You know, the telephone call, "Hey, you gotta go check if anybody fishing down there." And you think oh, crap, bouncing all over the pastures... It's a long way down. Bounce, bounce, bounce. And you have to hit down the end over here...

DT: So you're coming down here, Ki'iokalani.

MR: Well, not... the road used to come... You used to have to gadung, gadong, gadung...

DT: I see.

MR: The road would always go, the small inlets, the road would always go down that, because it was easy to make. You sit there, put your spotlight on, looks alright, looks alright. Vrrmmmm... You go across, same thing the next one. That's what I remember.

DT: And your job was to go down and warn the fisherman, if they were there, the tidal wave was coming. Most of the fisherman, where would they be coming from? Were they related to Kahuā Ranch?

MR: No, Kohala. And some from Kahuā, that had their little jeeps with them.

DT: Were there any families, names of people that have used this as a fishing area for a long time?

MR: Mostly the name, most like the Ho'opai's, which are all involved in Kahuā, and some of the families in Kohala, I've forgotten their names. But it was pretty well protected because the Kohala people could come and all, and nobody really screwed up.

DT: Maybe if you could just give me your opinion, your perspective on what something like this, three miles offshore, an agricultural operation like this, growing fish, what potential impact it might have on the cultural activities... Basically your way of life which is the cultural activity for this place.

MR: Well, I don't think it would change anything. The only thing that I would... questions I would wonder about would be criminal. Would people try to go get fish out of the trap? Would they use your property, in this case my property, Kahuā property to provide an area for them to get their jeep down, or whatever they're going to do? How is that going to work? How you gonna protect your, that is the fish owners, situation out there? You can handle the boat in, but sometimes the guy has the ability to come in and operate a whole bunch of stuff from the shore. You're better off. A guy can bring a boat in, you can use the, whatever you're going to use, little explosive things, whatever you want. It can be loaded on from shore, you know a boat. I just kinda wonder is that a possibility? I would kinda wonder how that would go. Actually, these are probably as good a place on shore as you could have to get down into the water. I understand, I realize all is done by boat, and all the rest of it, but I may be having a dirty mind, figuring, how these kids, how some of them are going to take a whack at this.

DT: It's good to make sure that we've got that covered.

MR: Because it's easy to point out. It's below the surface. Nobody's going to see it at night.

DT: Yeah, they'll be noticeable.

MR: And you're probably going to have to, how you gonna guard it?

DT: That's a good question, good concern. But overall, you don't think it wouldn't affect...

MR: It doesn't affect...

DT: It doesn't affect any of the activities that you and your ranch...

MR: No, not at all.

DT: Because you really are the primary users of this area.

MR: Yeah. It wouldn't affect at all.

DT: And I have talked to the Ho'opai family. Are there other people that you... I talked to you, Pono, Ho'opai, talked to Bill Akau... Who else do you suggest I might talk to who have history in this area on land, or particularly in the ocean? Anybody you can think of?

MR: Not right off hand. Old Chuck Paolo, but he's been dead a long time. Used to spend some time, you know, Eddie La'au... You talk to him?

DT: Well I'm gonna go talk to Lala.

MR: Yeah, Lala. And, that's all. There's not a lot of people that have that much to do. I mean I don't know. There's some guy 18 years old, knows all about the... doesn't count.

DT: I'm talking about those that have a long time standing that they were continuing from their father, you know, like you say, La'au, Akau. So those are the ones I'm interested in talking to.

MR: OK, I don't see a problem.

DT: Thank you for taking the time. I think that's important.

MR: Thank you very much.

Meeting with Pono Von Holt and Angie Von Holt on June 17, 2008 at Ponoholo Ranch headquarters.
Interview by David Tarnas

DT: Thanks for meeting with me to talk about your stories and history with this land and ocean. A company, Hawai'i Oceanic Technology, is proposing to establish an open ocean aquaculture operation about 2 ½ to 3 miles offshore Malae Point. They must do an Environmental Assessment as part of their application to DLNR for an ocean lease. Part of an EA is a Cultural Impact Assessment to better understand the cultural history, practices and values related to this particular area. I already talked to William Akau, who provided helpful history and perspective. He said I should talk to Monty Richards of Kahuā Ranch and you - Pono Von Holt of Ponoholo Ranch, since you two own or lease most of the land in this region. I talked to Monty and he said the project sounded fine to him, and agreed to meet with me later to share whatever stories he had about the land. He also said to talk to you. Today, I'd like to hear your stories about the land and ocean around Malae Point in the ahupua`a of Ki'ioikalani and Puaiki and its surrounding region. Please tell me about how you and previous generations of your family have lived, worked and played on this land. Tell me about your family's activities today and your plans for the future. Please also tell me about the cultural values you associate with the place. And let me know how you think this proposed project might affect cultural practices. Thanks.

PVH: This is Ki'ioikalani. It was part of Kahuā along with most of the neighboring land to the south in what we call the Pahinahina lease. Then they had Kahuā 1 and Kahuā 2 to the south. When the ranches divided, Ponoholo Ranch got this piece at Ki'ioikalani. Kahuā has the piece next door at Puaiki. Kamehameha Schools has the next parcel. An educational nonprofit organization has the lease on that land. You should talk to Andrew Akau about that. There's a holua slide there. I was amazed when I saw it. They're going to restore the holua and run educational programs there.

DT: How did you at Ponoholo Ranch use the shoreline area?

PVH: It was seasonal use. At certain times of the year we stayed over for a week. Camping. We'd go fishing along the shoreline. Explore around. There's places to see all along the shoreline. On our piece, there's a canoe shed.

DT: What kind of fishing do you see in the waters in front of Malae Point?

PVH: Shore fishing, trolling and some 'ōpelu fishing.

DT: Where would they be fishing?

PVH: Trolling is usually close to shore...the ono lane it's called. 'ōpelu is pretty close to shore too. They fish all along the shoreline. You should talk to the 'ōpelu fishermen.

DT: Besides Kahuā and Ponoholo Ranch and your families, what are the names of the Hawaiian who owned it before?

PVH: I don't know, but you should do a title search and find out. Once you get some names call me and Monty to see if we recognize the name of the family. Maybe the Hook family was one of them? The Hawaiian families sold parcels to Kahuā Ranch, like Ki'ioikalani. In the 60s, Kahuā did a land trade with the state. We did it to consolidate the land holdings. We gave up a midsection area so that we had a large continuous area from Ki'ioikalani to Kahuā Ranch to the south with the Pahinahina lease and Kahuā 1 and Kahuā 2, etc...

DT: Any other Hawaiians associated with the land I should talk to?

AVH: How about the Ho‘opai family? You should talk to Bernard. What do you think (looking at Pono).

PVH: Yeah, that’s a good idea. You should talk to Bernard, and his dad Kimo.

DT: Should I talk to both? I’ll call them to see if they can meet with me.

AVH: Maybe he could meet with them here?

DT: Thanks, but I think I’ll just call Bernard and Kimo and ask to meet them at their place.

AVH: You could sit at their outside table and talk.

DT: Sure. That sounds great. I’ll call him. We’ll get together and just talk story.

PVH: We use it. The Ho‘opai family uses it. and other PonoHolo cowboys. Kahuā uses it. Tim Richards uses it. And their cowboys, too. You see, the two ranches share the camping site. We have keys and people sign up for certain times.

DT: Are there any stories about the land at Ki‘iokalani that you can tell me? Any stories or Hawaiian history? Anything about the ahupua`a, and their names?

PVH: Not really. Just that the ranch used it for a long time - even before there was a road. We’d use it to go fishing, camp. Ranch hands would use it. Ki‘iokalani ahupua‘a is owned by Kahuā, not leased like the Pahinahina lease. I don’t know who owned it before. You should ask Monty who the original owners were. Call me and tell me, too. I’d like to know.

DT: What impacts, positive or negative, do you think this proposed project might have on your cultural activities at Ki‘iokalani and Puaiki?

PVH: I don’t think it’ll have any impact at all. We’ve got to feed the world. I studied aquaculture and almost went into it, but I decided to do cattle. Getting technology developed and other improvements in aquaculture is important. Maybe this project work. We need it.

DT: Thanks for your time. If there’s anything else you want to tell me about this, please call me. I’ll also follow up with the Ho‘opai family. And I’ll write up my notes and get them to you to read before I use them in the report I’m preparing.

PVH: OK. Thanks.

AVH: Thanks.

Meeting with Kimo Ho‘opai, Leina‘ala Ho‘opai, and Bernard Ho‘opai, June 27, 2008 at the Ho‘opai home at Ponoholo Ranch, North Kohala, Island of Hawai‘i. Interview by David Tarnas.

DT: Thanks for meeting with me to talk about your stories and history with this land and ocean. A company, Hawai‘i Oceanic Technology, is proposing to establish an open ocean aquaculture operation about 2 ½ to 3 miles offshore Malae Point. They must do an environmental report as part of their application to DLNR for an ocean lease. Part of the environmental report is a Cultural Impact Assessment to better understand the cultural history, practices and values related to this particular area. I already talked to William Akau, who provided helpful history and perspective. He said I should talk to the konohiki Monty Richards of Kahuā Ranch and Pono Von Holt of Ponoholo Ranch, who own or lease most of the land in this region. I talked to Monty and Pono and they gave me some great stories and perspective and said that I should definitely talk with you, the Ho‘opai family, who has been using the area for generations. Today I’d like to hear your stories about the land and ocean around Malae Point in the ahupua`a of Ki‘iokalani and Puaiki and its surrounding region. Please tell me about how you and previous generations have lived, worked and played on the land. Tell me about your family’s activities today and your plans for the future. Please also tell me about the cultural values you associate with the place. And let me know how you think this proposed project might affect cultural practices. Thanks. To start off, could you tell me your name, where you were born and about your parents?

KH: My name is James William Ho‘opai. Born January 24, 1937. My dad was Clement Ho‘opai. My mom was Lily Kaliki, born in Hawi. I had two brothers and two sisters. Dad was working on the ranch starting in 1929.

LH: My name is Genevieve Leina‘ala Akina Ho‘opai. My dad was Charles Akina, born in Kona. My Mom was Rose Peahi Akina. They moved here in the 20s. My dad worked at Kahuā. We had eleven children in my family. Eight girls and three boys.

DT: When did you start using this area around Malae Point and Ki‘iokalani?

KH: My dad started to use this area in 1938. We call it Black Point. This area here (pointing to the South) we call Pu‘u ula‘ula. Dad started fishing there in 1938.

DT: Please tell me about the fishing.

KH: The fishing was mostly shoreline fishing, reef fish, opakakui, kole, kala,

BH: It was diving, pole fishing, netting, throw net, cross net. You caught whatever you can reach!

DT: Did you use boats?

BH: Once in a while, we’d go in trolling there and come into the bay here (pointing to Keawenui Bay), but it was all zig-zagging along the coast, not too far offshore. If it was good weather, southerly wind, you could go to Polulu.

DT: How far offshore on average would you be trolling?

BH: Oh, maybe average a mile from shore. Or closer in at ½ mile or so from shore. Sometimes out to 1 ½ miles or so. When you’re trolling you stay in pretty close.

DT: Has fishing changed since the early days when you started fishing?

BH: When Dad used to go to the beach, there was so much fish. There was no makai road, so not many people got there. Fish was plentiful compared to now. The fish population is gone down over all these years. That's why some think you got to get what you can today. It's all left overs.

KH: Not so many fish today like there was. We used to get plenty.

DT: What kind of fish would you fish?

BH: Pakakui, kole, manini, miko, waowao, palani,

DT: Would you go outside 1 ½ miles from shore?

BH: Sure, if you're going to the fishing buoy.

DT: Was this area about 2 ½ - 3 miles offshore used by any fisherman or boater?

BH: I don't think so. One thing is it's too far out. And if there's nothing biting there, no reason to go. Trollers try to stay about a mile offshore.

DT: What about 'ōpelu fishing in the area?

KH: Yes, there's about three boats from Kawaihae who just fish 'ōpelu.

BH: Three from Kawaihae just concentrate on 'ōpelu. Lala and Cambra and Yamamoto still fish 'ōpelu from Kawaihae. There were two other families that fished 'ōpelu from Mahukona. All of the 'ōpelu fishing is about ½ mile offshore or so.

DT: What is the use today for this area?

BH: Mostly trolling.

KH: Yea, mostly trolling...there's lots more boats now.

BH: Some jet skis...that's another thing that goes along the shoreline. There's lots of jetskis. That's been picking up.

DT: How far from shore do they go?

BH: Everything is close to the shoreline. No more than ¼ mile out. Close to the shoreline.

KH: There's more trolling now than used to be. Last year there were more boats. This year slowed down some.

BH: It's gas prices, the numbers fluctuate. They troll all the way from Kawaihae to Pololu in a zig zag pattern about 1 mile offshore.

DT: What other things does your family do on the shoreline?

BH: Go camping, fish, gather opihi.

KH: A`ama, wana, ukiuki

LH: Pipipipi

KH: Leho

DT: Do you see some of these around anymore?

KH: Nope.

BH: No, they've all disappeared.

DT: Could you tell me what you know about the history of the area, some stories you'd tell your children and grandchildren about the place, the Hawaiians who used it, and your family?

BH: All along the shoreline there were lots of fishing villages. You know Hawaiians, our ancestors, really live and use the shoreline. There's lots to see. We were taught to take care of the land and it would take care of you. We teach our kids that. Don't just buy stuff, go out and hunt or fish. We remind them that there used to be lots of fish, and what we used to get from the ocean and shoreline. We'd tell them stories of how we used to get them. Dad used to tell stories of riding on horseback from the Ranch to Pu'u ulaula to Black Point.

KH: It would take along time to get here. We'd bring everything down here and stay down for a week. We'd teach the young kids. All alongside bay there would old Hawaiian trails going up to the mountain. They got walls here on the land about ½ way up where the people from mauka would trade for fish from the people who lived makai. There's a heiau and stone walls here about ½ way up and the families would camp there overnight waiting for the mountain families to come to trade poke meat to the mountain families. There's lots of trails mauka-makai.

DT: Would cattle do to the makai lands?

KH: Some.

BH: It is dry. But, my dad actually had fat cattle over here at Waiakailio. The problem was that you had to drive them all the way up mauka! It was challenging old style work. At one time, it was a much bigger ranch. This was the boundary lands that separated Parker Ranch here from Kahuā Ranch that started here on this property now, which we call it Black Point, all the way to Kawaihae. It was really big. This area here we call Pahinahina lease, which is state land. Here we call it Pu'u ulaula.

DT: What kind of fishing do you associate with this area of Black Point?

BH: Besides the shore fishing, there's trolling. You ask any fisherman and he'll know Black Point. Trolling along the point, you can catch ono. There's some kind of shelf offshore so you follow that about a mile offshore - A mile and a half at the most.

DT: What kind of stories would you tell your kids when you're camping at Black Point?

BH: For one thing, we try to get my own grandkids to listen to stories of their great grandfather. The big schools of aku and ahi that my ancestors used to chase down. Now, there no more. But, we tell the stories to keep the history alive. And with this project, now we can tell the kids here is what our technology is today. This is what we're talking about in the future now that there's not enough fish left..

DT: Any other use of this area?

BH: The only ship you see way offshore is the Young Brothers barge, once in a while a cruise ship, very seldom some megayachts and of course some military vessels.

DT: Would this proposed project have an impact - positive or negative - on your cultural activities?

BH: It wouldn't bother me. It'd be nice to let these kids know there's something out there.

KH: It would be OK with me...wouldn't bother me.

BH: It's progress. With all the fish gone from the ocean, we need a different way to get our fish. Do they plan to release any ahi from the farm? That's one way to give back. We were always taught that if you use the ocean, you always give back. That's *pulapula*, the more you give back, the more you get.

KH: That's what we've always said.

DT: DLNR would have to approve any release of fish and they haven't indicated any support for the idea. But, I'll include your suggestion.

BH: Well if you were allowed to release some ahi, it'd be good. Just something to go back to the ocean.

BH: Maybe you could

LH: It's progress. In early days we'd go to the beach with the family, there was always fish. Now with Mahukona Road, lots more people get to the shore. I stood at the point here and looked around and there weren't any fish or crabs around anymore. Nothing. I stood there for half an hour. Couldn't see a fish in the ocean or a crab on the rock.

KH: Used to be so many but not today.

LH: This is something new, interesting for the younger ones. Like Bernard said, if they let go some fish, the kids would have place to go fishing.

BH: I know you run across people who are against what you want to do, but for us and our families. it's OK. We teach our kids the way we were brought up. And we let them know there's this new technology. We need to have an open mind. Can't stay the same. In order to see the future, look at this technology. You gotta start some place and once you get it going, you can do it many places and it doesn't have to be close to shore.

LH: It's progress. Stay away from the negative. Stay on the positive side for them.

BH: I hope the project goes well. Maybe if you can sell the ahi here, the result will be that buying a piece of ahi would be cheaper. Right now the price is sky high. Fishing is slow. Fuel prices are going haywire. My grandkids here - their dad has a boat and he's trying to get his boys into it. We're fifth generation paniolo, so I make sure to tell the grandkids about our ranching history, get them to ride horse.

DT: The paniolo tradition goes way back in the Ho'opai ohana.

KH: Yes, and in her family, too (indicating his wife Leina'ala). Her uncle John came with Pono's dad.

BH: People pay attention to each other here. We watch out for each other. For a while I stopped mowing the lawn here so it would return to pasture, and people started calling and asking, "Is something wrong with Bernard?"

LH: We'd say, "No, no. he's just letting it go to pasture. He's OK."

BH: But people pay attention and take care of each other. You give back in whatever you do. If you take care of the land and sea, it'll take care of you.

KH: That's what we've always taught.

BH: The more you give, the more you get blessed. My grandkids are staying during the day with their great grandparents. I'm lucky to have my parents have them teach these kids. Lots of people tell me, "You're lucky." I am lucky! This is a big help. They are being raised here on the same land we were raised on. Every chance we get, we take them out, and slow them down, and tell them stories of our history. As they get older, it'll help.

DT: Are there other long time paniolo in these parts besides you, Uncle Kimo?

BH: There's no other old-time paniolo from Kahuā around now. Dad's the last of the old-time paniolo for Kahuā.

DT: When you went camping with the kids, what stories would you tell them about your own family and your connection to the land.

BH: My uncle, Dad's brother, he was living on Maui. He had diabetes really bad. Some time ago, he called Mom asking if I was going to Black Point.

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LH: It was the new year.

BH: Yes, he called then. He always used to do that and now that he couldn't hardly see already and he had to be in a wheelchair, he insisted on going to Black Point. Something about remembering what he did at Black Point. They were good memories for him.

LH: Two weeks later, he died.

BH: They were good memories for him. He was remembering from small kid time when he was using the beach.

DT: Are there other families that have used Black Point and the land there for a long time like your family?

BH: No. Anybody else who uses the beach today are new hires. We're the family that goes back a long time. My dad's dad was the one who pushed all the roads in.

LH: Yes, my father-in-law did all the road work.

DT: Was it used by anyone else?

BH: It was used before by some fishermen from Kohala. They would drive from Kohala to the coastline. They'd go shorefishing...hooking the fish, sometime harpooning them from shore. There's only one person doing that now. My son's girlfriend's dad does it. He was taught by his dad before.

DT: What did Kamehameha Schools/ Bishop Estate do with their land at Puanui?

BH: KS used it for camping. Big Bay is north of Puanui. That's the boundary here for Chandi's place. At Puanui, they found lobster traps. They were using the grounds there to catch lobster. There used to be lots of them then. This area here at Kehena was all Parker Ranch.

DT: Did Parker Ranch use this area?

BH: Not much. It was mostly Kohala people coming here to fish. You remember when Chandi fenced off the access and there was that *hakaka*. The fishermen need to know that if you want to get there, you gotta walk the shoreline. They were so *ma'a*. They got used to driving to the shoreline. They were spoiled. You guys are getting lazy. And I notice that ever since Chandi bought that piece, and closed access, the fish came back.

DT: Are there any 'ōpelu ko'a in the area and does anyone take care of them?

BH: Well, the 'ōpelu boats fish here, so there must be a ko'a. But, I have no memory of anyone taking care of the ko'a. I never knew there was one there until I see 'ōpelu boats out there. Even these 'ōpelu fishermen, their parents fished it too before them. They were taught where to look for 'ōpelu. They'd use onshore markers, Red Hill, Black Point, line them up to find the fishing grounds.

DT: Is there any thing more any of you would like to say about the cultural activities or significance of the land, or stories, or your perspective on any impacts of the proposed project on cultural activities?

KH: No, that's fine.

LH: No, I think it's fine. Good luck.

BH: I don't have any problem with it. My main concern was releasing the fish if you can. I'd love to see that. The project sounds good. The main thing is that it works.

DT: Thank you very much each of you for taking the time. I'll write up this interview and bring the notes to you to review and approve before I use them in my report. OK? Mahalo.

Interview Transcription
Eddie (Lala) La'au
July 3, 2008
at Kawaihae with David Tarnas

Eddie Lala La‘au is recognized as the kupuna ‘ōpelu fisherman of the area. His father was an ‘ōpelu fisherman before him, active in the 1940s and afterward. Lala was interviewed by David Tarnas on July 3, 2008 at the Kawaihae Fish Market, now owned by his daughter. The interview was recorded and a transcript was prepared. The transcript was reviewed and corrected, and permission to use the transcript was granted by the interviewee on September 17, 2008.

DT: So today is July 3rd, 2008, and I’m here today with Eddie La‘au. Many refer to him as Lala. We are at the fishhouse on Akoni Pule Highway.

EL: Akoni Pule Highway.

DT: Akoni Pule Highway in Kawaihae. [*David Tarnas presents a brief description of the proposed project and location off Malae Point/Red Hill /Black Point area of Kohala*].

... So I’d be interested in your description of this general area, here. You spoke of in your previous interviews about the fishing ko‘as all along the shoreline here... Red Hill, Black Point...

EL: All the way up.

DT: All the way up... And Mahukona to Kawaihae. You talked about ko‘a all along the shoreline. What I’d be interested in is to ask you to describe what you would... what the activity, that you know of, is in this area much further offshore, in deep water. So maybe describe what’s happening in here, because I think that’s probably the zone where most of the activity is, and then tell me, what you know of, the activity out here. And then we can get you perspective on what kind of impacts this project might have on your activity... positive or negative or nothing.

EL: So from Kawaihae all the way to Mahukona. We fish on the 150 feet depths, and that’s where the small boats fish too. They’re trollers. They troll for ono, mahimahi. It’s about almost the same depth. 150, 200 feet. But I think from 150 to 130 ‘ōpelu. And all along the shorelines, there’s a lot of ‘ōpelu ko‘as, right down the line. Like say as far as this area concern, that’s the way we always fish.

DT: You said it was seasonal...

EL: Yeah. It is a seasonal thing.

DT: Want to tell me more about that and just sort of ...

EL: Well, ‘ōpelu season usually start from August and be to January. That’s net ‘ōpelu. And after that, looking at bottom fishing usually going to... onaga you look at... about 130 fathom, about that. 80 fathoms opaka.

DT: 80 fathoms for opaka?

EL: Opakapaka. Yeah.

DT: Opakapaka. And you said Onaga...?

EL: 130 fathoms.

DT: 130 fathoms.

EL: That's the deepest most of the fish may go, bottom fishing.

DT: Sure, the bottom fishing would be the deepest and that's... onaga is one of the deepest of the bottom fishing.

EL: Call it red snappers, yeah?

DT: Red snappers. And they're at 130.

EL: 130. Well, other than that, you may go fish, unless they have a buoy there, like they have a couple buoys out there, 7 miles off Kawaihae.

DT: And they act as...

EL: Mahimahi. They draw the mahi and the ahi. Like OTEC buoy.

DT: When you fish for 'ōpelu, could you describe to me... Just when we started, you started to describe who else has been fishing, how long you've been fishing and tell me maybe about your dad and maybe when he started fishing... Could you tell me a little about that?

EL: Well I've been fishing about, probably about 50 years. My dad was fishing longer than I did. He did mostly fish for aku when the aku is on. Then after the aku is over they fish for 'ōpelu, or bottom fishing.

DT: Were aku and 'ōpelu...

EL: It's a different kind season. Summer months is for the aku. Winter months, 'ōpelu. And, yeah, they keep going one season to the next season.

DT: When was the... could you tell me about when was your dad born and where was he born? I'm just trying to... could you tell me some of your family connection to this land and to their fishing activity? Their genealogy a little bit.

EL: My dad was born in Kawaihae. We used to live at Spencer, and my grandfather was brought up in . Grandmother, yeah. They had a property there. Kawaihae, where the shopping center is, we lived there for awhile, for thirty years probably. Grandmother bought that place long time ago...

DT: This one?

EL: Kawaihae, by the shopping center.

DT: She was living in Puakō.

EL: Puakō, then we move to Spencer's, came to Kawaihae. We bought out Yoshikami. Yoshikami owned the aku boat before. And my grandmother bought it from Yoshikami.

DT: So they lived in Puakō. You know when they first moved to Puakō?

EL: I really don't. I guess they started from there, Puakō, and they moved like this, Spencer and Kawaihae.

DT: Sure. You think they were born at Puakō?

EL: I pretty sure, yeah. Way back, though. Kind of far back. Had lotta fish those days.

DT: And they were fishing at that time.

EL: Yeah, fishing. Mostly fishing. When they bought the business, that's when they went to aku, bottom fishing, and 'ōpelu.

DT: And you were born when and where?

EL: Oh, I was born in Kawaihae, March 15, '34...

DT: And are you...

EL: In fact I was born here.

DT: Born right here?

EL: We had this place but we moved to the sand below. The sand, that's where the business was... We stayed there. And every time we passed this place I said, "Who's place is that?" Had a house on 'em but nobody lived there. Mango trees and ... ahh it was great. Until the harbor came in. They told us...

DT: When was that?

EL: Oh, I think in the '50s. Think so, in the '50s. I was in high school.

DT: What happened when the harbor came in?

EL: Then we had to move back here. The old place. Good thing my grandmother bought it. Property was cheap then.

DT: Did she buy it when she bought the aku fishery?

EL: Yeah. She bought it, the aku first, but yeah before that, she bought that then she bought the Yoshikami business.

DT: I see. So she had this first, and then she bought Yoshikami's aku business. And that's this...

EL: That's the boat. One of the boats. The "Kainehi".

DT: How do you say that?

EL: "Kainehi".

DT: Oh, I spelled it wrong. “Kainehi”.

EL: But we always called it, that’s the ‘ōpelu boat.

DT: That’s the ‘ōpelu... This ...

EL: That’s the aku boat. [EL points to photo of his father and partner and his boat]

DT: This is the aku boat, the bigger one. And the ‘ōpelu boat’s the smaller one.

EL: And the back one’s the bottom fishing boat. That’s my grandfather, Jack Paulo. He fish for bottom fish all year round. You can fish bottom fish all year round.

DT: What was your grandfather’s name?

EL: Jack Paulo. P-a-u-l-o.

DT: Ok, Jack Paulo. There’s a Paulo family Kona, is it a Kona family?

EL: I know he has a Kona family.

DT: Oh yeah ‘cause the families I know, Milolii.

EL: Used to go down to Captain Cook, my grandma them. Jack Paulo.

DT: What was your grandmother’s name?

EL: Annie La‘au.

DT: And then it was your... they had your father.

EL: Yeah it was something like that.

DT: Eddie La‘au senior is dad.

EL: Yeah, took his mother’s maiden name, his mother’s name.

DT: And did Eddie, your dad, have siblings, brothers or sisters?

EL: None. He was an only child.

DT: And this fellow in the picture, James.

EL: My mother’s brother, Jimmy Merseberg.

DT: Got it. And so your mother’s brother is Jimmy Merseberg... they fished together for some time?

EL: Oh they fish with my grandfather, that’s Paulo. My father has his own crew. He has about four, five people work for him.

DT: So this is another picture of you with the 'ōpelu boat with the glass box look underwater. Could you describe to me if you could, what you would do leaving out of Kawaihae... You would come up and sort of how you would use this shoreline. If you could just take a few minutes and describe what your 'ōpelu trip would be...

EL: Well I always look for a mark, like Red Hill, there's a ko'a there... Even outside Kawaihae there's a ko'a there, Kona ko'a. Right down the line. There's all ko'as down the line.

DT: All in here.

EL: Yeah. Only in the say, 130 feet, 150 feet, sometimes closer. Mostly the areas about 130, 150 feet.

DT: So you would stop at each one along the way?

EL: Those days we had different ko'as, so I stopped along all the ko'as and feed.

DT: Did you feed the ko'a and maintain the ko'a?

EL: I always feed and check if there's fish there. If the 'ōpelu coming in, if they start to eat. Then I go out and catch it. Usually, like I say, there's a season. It's not like they are always there. You might have a few. A few might eat, yes, but that's about all. Only get 20, 30 pounds. But season time, that thing just ball up. Two... hundred, who knows.

DT: I've read about how people will maintain the fishing ko'a by feeding it. And people have their own mix that they use of different plants...

EL: Well in the old days, we used to use... Actually, in Kona they use pear, they have large pear there. But we used to use the taro. Taro I think we got practically free, but not now. Lot of taros... Lotta time we exchange the taro for fish. You like fish? Here. You get a big bag of taro. Lotta work on that taro... you gotta cook it, scrape it. That's why. It works.

DT: So you use taro in the early times to feed the ko'a. What was the thing you said they use in Kona?

EL: Avocado, pumpkin...

DT: Pumpkin? And avocado.

EL: Pumpkin, avocado, taro.

DT: What else, once the taro wasn't so available, what'd you start using?

EL: Quick oats.

DT: Oats, sure. Did you say plants only or did you ever use...

EL: After that we just did the oats, it's much easier. You just buy the box and there you go...

DT: So that was pretty much what you use since then.

EL: Yeah. It's so easy. You just buy one box, boil it, you get almost 5 gallons.

DT: How do you prepare it? Do you prepare the oatmeal?

EL: Yeah, usually I cook it or can use it raw, like that.

DT: But if it is dry it will float, yeah?

EL: No, no. It sinks. Goes down, comes up. By the time it comes up the 'ōpelu eat it up. But usually I cook it because you gotta save money.

DT: So you want to spread it out...

EL: Spread it out.

DT: Volume.

EL: Yeah.

DT: So you would maintain the ko'a, feeding the ko'a, for the last... How long would you say you've been using oats?

EL: Well, more or less I say 50 years now.

DT: Yeah, 'cause taro got scarce about 50 years ago.

EL: Too expensive.

DT: yeah, so then how often would you go out to check the ko'a, feed them, and see how many fish there are?

EL: Well usually I start feeding them July, check 'em once in a while, see how it looks. When it starts building up, then I take my net and catch it. Sometimes you can catch it in July. July, August, mostly August, September, like I say, winter months.

DT: So would you continue to feed the ko'a even as you're starting to harvest the fish?

EL: Yeah I usually start earlier, check it out.

DT: When you are fishing along, and you're doing a trip from Kawaihae, how long would you spend out and would you return to Kawaihae or would you return to Mahukona or anything?

EL: Oh no, I return to Kawaihae. I get a trailer boat, so easier right here. Takes me... I usually go in the morning, about 6, back about lunchtime. Because I usually caught fish like that. Early morning and get back. Some days I don't caught fish, so I go out and then 2:00 I get back. Fill up the boat. Anytime you fill up the boat you come back. Before, 9 o'clock we back, no problem, fill up before 9 o'clock.

DT: What's it like now?

EL: Well..

DT: I mean in these recent years...

EL: Well, some years fine, some years slow. It goes up and down. I guess, I don't know, it's just not like it used to be, you know?

DT: What do you mean?

EL: Before was plentiful. Every now and then there's a lot. When it comes in, it comes in, but I guess I don't spend the time to catch it. I just fish for 'ōpelu, concentrate on one thing only. Now I'm outta the water.

DT: So you target one fishery.

EL: Just 'ōpelu. No such thing as looking for mahimahi or ahi like that.

DT: You had some pictures in here of the 'ōpelu net, very long, stretched out [*showing photos*]. The chum bag.

EL: That's the chum bag.

DT: Rock to carry it down.

EL: I used lead.

DT: Lead?

EL: Yeah.

DT: And then you'd yank it and open up the bag.

EL: Yeah, Take it down to whatever depth you want, take it off, yeah.

DT: Here you were talking about 150 feet depth, again. Red Hill, Black Point, Honako'a Gulch. How you used marks on the shore.

EL: Like Honako'a Gulch, Honako'a usually, maybe 90 feet. Shallow water. Smaller 'ōpelu. Most days, like I said, 130, 150.

DT: Yeah, so at Black Point you're probably...

EL: 130.

DT: 130? At Black Point, 130 feet.

EL: 130, 150 feet.

DT: 150 feet.

EL: Now you get depth recorder...

DT: Yes, so you actually can really tell what the depth is. This was a picture, how they described it fishing from a boat here. So it's very complicated.

EL: Yeah. At first was complicated. After you get used to it.

DT: So the... you mentioned the trollers. Even though you don't troll, you see where they go, where, what depth they go at. So they're also about what depth, and when did you see them out there?

EL: Well they about 200 depth, for 150 up. 150, 200.

DT: Yup. So they follow 150 or 200 foot contour.

EL: I trolling at 150 also. I usually troll home.

EL: Sure, makes sense.

DT: What do you target? What kind of fish do you go after in that 150 foot...?

EL: Mostly onos right now. Mahimahi.

DT: Through the year, does the season change, type of fish that you can get while trolling?

EL: Yeah, it's all in the season. Sometimes when the mahimahi comes in, it comes in a lot. They like ono, comes in and goes out... back in again

DT: Have you found that the catch from trolling is about the same as it was 10 or 20 years ago, or is it different?

EL: It's different.

DT: Tell me what the difference is.

EL: Well, before used to go from here to here, or Black Point and back, that's about it and you get 10, 15 mahimahi trolling. But now we get a lot of boats. Before I can count the boats on my hand fingers. One, two, three boats. Now see lot of boats out there. That there is the difference.

DT: So, so many hooks in the water?

EL: More lures in the water...

DT: More lures in the water...

EL: Yep. Lotta lures...

DT: So you've seen your catch decrease?

EL: Yeah, automatic out there going up and down, one lane. Before you only see one boat going up and down one lane. Now maybe 20, 30 who knows... During the weekends, lots of them out there.

DT: Is that the high use... is that weekends?

EL: Weekends, yeah.

DT: When would you fish, during the week, weekends, or whenever?

EL: Whenever I get time. I'd rather fish during the week. 'ōpelu doesn't matter, like I said we only had three 'ōpelu boats.

DT: So could you tell me about the other people in the fishery? You said there's three 'ōpelu boats. You said yourself...

EL: Cambra...

DT: What's his first name?

EL: Cambra. I call him just that name, Cambra.

DT: Ok, that's what you call him, Cambra. How do you spell it?

EL: C-a-m-b-r-a

DT: C-a-m-b-r-a, Cambra. So Cambra started fishing with, you said, Yamasaki.

EL: Yamasaki.

DT: Now what was Cambra's relationship to Yamasaki?

EL: Father-in-law.

DT: Yamasaki was Cambra's father-in-law, and he was an 'ōpelu fisherman?

EL: Yeah, he also was a politician.

DT: So Yamasaki... So what kind of time frame are we talking about for Mr. Yamasaki?

EL: Well, Yamasaki... you see that 'ōpelu boat there alongside my dad's boat? Well, they bought the boat same time. A few boats was bought that year.

DT: Really?

EL: Yeah. One was Yamasaki. Ernesto, I think it was. Well, anyway, Yamasaki had one like that, a little smaller. But it was from the same builder.

DT: Was it built here?

EL: It was built in Hilo.

DT: Build in Hilo.

EL: Yeah.

DT: About what year do you think this boat and the other boats were purchased? Best guess.

EL: I'd say in the 40s I think. Pretty sure.

DT: So Yamasaki and your grandfather...

EL: My father...

DT: Your father bought the boats at that time. Ok.

EL: They were fishing for 'ōpelu...

DT: So Yamasaki was a contemporary of your father.

EL: Yeah.

DT: So you were saying that before then your grandfather also fished.

EL: Yeah.

DT: Were there other people at that time? When your grandfather... Do you remember stories of your grandfather, when he talked about what fishing was like when he was a kid?

EL: [laugh]

DT: Do you remember any stories?

EL: I know when my father was fishing, a lot of people was fishing also. They had a lot of aku boats.

DT: At the time when your father was fishing there was a lot of aku boats.

EL: Yeah. Small boats.

DT: How many about out of Kawaihae?

EL: My dad had two. Berdon...

DT: Berdon? They had a couple?

EL: They had one. Rudder Yates. He died, though.

DT: Rudder?

EL: Rudder Yates, he died.

DT: Rudder Yates. He had another one... And this would have been in the 50s, 40s?

EL: 40s. Long time.

DT: 40s. So mostly aku boats. And you're your dad was the only 'ōpelu boat out of Kawaihae?

EL: Well, a lot of 'ōpelu boats.

DT: Also, more. There were other 'ōpelu boats.

EL: Had about 10 or 15.

DT: 10 or 15 'ōpelu boats, out of Kawaihae?

EL: 10 or 15 on the sand.

DT: How many different families fished?

EL: Lotta families were living Kawaihae those days on the beach. They had their own canoes. Actually they had canoes, boats. There were more 'ōpelu fishers than now.

DT: Much bigger fleet.

EL: You could see 'em going out of the bay. Racing each other. [laugh]

DT: To get to the ko'a first.

EL: To get to the ko'a.

DT: But today you say there's three.

EL: Three. That's it. Those days fishing was a good life. You make a few dollars, fish to eat. Instead of working on the plantation. That's why we had most of the Filipino workers coming here to fish for my dad.

DT: Well, this area here, Black Point, you know it's, if you look at the land this is the Pahinahina lease that Kahuā has right in here at Puulaula, Red Hill area in here. And over here this is state land that Parker Ranch leased. So this is all ranching area in here. So I've been talking to the folks on land here to get their insights on what something like this might do because it's a neighbor. So I've asked, done some interviews with, I've mentioned, Bill Akau. Bill said I should go talk to Monty Richards, because he's the konahiki.

EL: Yeah. He used to fish before, pleasure fishing. He used to be the... I remember one time Kawaihae fishing club president. After that is Kohala. He was the foreman for the plantation.

DT: He ran Kahuā Ranch.

EL: Well he was one time a president for Kawaihae fishing club.

DT: Really, that's great. Sure you know him. Well, he knows you. He said make sure you go talk to Mr. La'au. So I talked to Monty and I talked to Pono, and Andy. Because they are the ones who have the greatest history with this area here. And I asked their input on how... what the history of the land and the cultural values, cultural activities, from their perspective.

EL: Well, good, Monty.

DT: They're both great people. Monty and Pono. They also mentioned, Pono said I should go talk to Kimo Ho'opai.

EL: Oh he's an old-time cowboy.

DT: Well he is the oldest-time cowboy now. So I talked to Kimo and his wife and his son Bernard. Talked story about their use because they have been camping here for...

EL: Black Point

DT: Black Point, yeah, they've been camping there for generations because it's a place that Kahuā has got.

EL: Oh Kahuā Ranch.

DT: And so Ho'opai has been using that place for a long time and so they told me about their use of the area and what their history and memory is of the use of the offshore area. What they describe is the same thing as what you describe, just in terms of offshore and depth. And I asked them the same question that I'd like your perspective on, which is, what would be your perspective on a project, located out here, what would be the potential impact might it have on your cultural activity, positive or negative or none at all or what ever. Just what's your perspective on that?

EL: Well, I know it won't bother the fishing. I think it's a great idea if it works. That's the way I look at it. Main thing is it works. I know out here, that depth, sometimes we get a lot of current.

DT: Yes, there is a lot of current.

EL: Lotta current.

DT: So it would be good if it works but there is a lot of current out there.

EL: Like I said, main thing is that it works.

DT: Yeah.

EL: Hey it puts food on the table is the way I look at it.

DT: Yes. Do you think that there might be other impacts from the project on other people's cultural activity?

EL: I really don't know. Hard to say. I mean, probably the fisherman... The fisherman might like it because I think there they can catch a lot of mahimahi. That's the way I look at it too. They gonna attract lotta mahimahi because they gonna attract a lot of fish. Just like the movie were here.

DT: Waterworld.

EL: They put that island out there... they attract a lot of 'ōpelu out there. Could have been. I said, hey, no wonder these guys hooking 'ōpelu. Hey, I better stop there and check it out. Sure enough when I get there and check it out I caught a lot of 'ōpelu under there, 'cuz 'ōpelu like the shade.

DT: Yes.

EL: I remember that one. Had the big barracuda too. During the day I had to leave there at 9 o'clock, because that's when they filmed the movie. So what I do I feed the barracuda, get 'em away from the island. And the 'ōpelu hangs around the barracuda so I get 'ōpelu away from the island. Unreal.

DT: What do you think of the proposed activity, basically a farming operation, in terms of the overall cultural history of this land that you and your family have been part of for a long time. Any perspective? Any comments you want to make on sort of this as an activity? How does it fit in general with the history of the land in this area here, knowing what you know about it.

EL: Well I don't think I expect anything bad. Only thing is my daughter has a little shop here.

DT: So, in terms of the fishing culture, you don't see any impact - negative or maybe positive - because of fish aggregating.

EL: I think it's a great idea. What we said, so long as it works.

DT: Exactly. Well are there any other people you think I should talk to who have that historical perspective like you in fisheries of this area?

EL: Not right now. Too bad the most of the old fisherman either dies or they moved out. They moved to the mainland...

DT: What were some of the names of these old fisherman?

EL: Donald Liu. He was like the best ono fisher.

DT: What's his name? Donald Liu?

EL: Yeah, he used to own the Kohala Kimchee.

DT: Ok, the Liu family.

EL: He was my best ono fisherman, He's great. Too bad he moved.

DT: I see.

EL: Yeah, he was one of them.

DT: Who are some of the other old time fisherman.

EL: Right now... by now mostly all new ones.

DT: I see. So the ones that are in the fishery now have been in it for how long?

EL: Same like me. Long time.

DT: 40 years? Who are the fisherman you would think of as... if there's no old time fishermen around who are your peers, who would that be. The two other boats.

EL: Oh you could talk to them. Especially Cambra. He does bottom fishing and 'ōpelu.

DT: Does he go out of Kawaihae?

EL: Kawaihae. His boat in the harbor, moored in the small boat harbor.

DT: That's his last name, Cambra. Ok I'll look it... Does he live in Kawaihae somewhere?

EL: Kohala.

DT: So I'll look, try to find him in the phone book. And then the other person, Billy Yamamoto?

EL: Billy Yamamoto.

DT: How long has he been in the fishery?

EL: 25, 30 I think. Both of them old timers.

DT: Yep. Does Billy go out of Mahukona or Kawaihae?

EL: Both out of Mahukona.

DT: Is there anyone else that goes out of Mahukona besides Billy?

EL: I really don't know because I usually launch my boat from Kawaihae.

DT: Sure.

EL: Billy, you know, he launch his boat at Mahukona.

DT: I see, I'll ask.

EL: There's a lot of trollers like I say, old time trollers. Kwanji.

DT: Kwanji ?

EL: He's one of the old timers.

DT: Ok. Mr. Kwanji. Is he in Kohala?

EL: Yeah, he's about 80 something years old. He's still fishing by himself. Gotta think back on the old timers still fishing.

DT: These are trollers.

EL: Yeah, he's a troller.

DT: Ok. Who are some other old time trollers?

EL: Mostly all new. New trollers.

DT: Well among the new ones, who are ones that have a sense of the history of it?

EL: I think you should see Cambra, he's one of the oldest.

DT: I've got a short list: Cambra, Billy Yamamoto, and then Mr. Kwanji. If I can get a hold of them. Just to find out perspective, that's all.

EL: Yeah Kwanji been trolling, like I say 80 years old, practically all his life.

EL: Ok. Yeah. I used to know all those fisherman. Now its just the young generation. They're more, I say, sport fishing.

DT: Yes.

EL: They like to troll, get out there, jump out the boat, relax I guess. But old timers they like to go and fish and work, I guess.

DT: So you see more of the fisherman out there, and you would describe them as sport fisherman.

EL: Yeah, I say more sport fishermen. The weekends here is good fishing. The fishers go out for ahi. It's good, real good.

DT: Well you have helped with the process by giving me the history. I'll write up the results, characterize the activities in the area-- cultural activities, historical activities-- and then what the potential might be according to these perspectives. If you think of anything you might have wanted to say, just give me a call. What I'm going to do is write up my notes and our conversation and then give you a copy of it so that you can look at it and make sure it's correct or if you wanted something taken out, take it out. So I'll bring it back. I'll give you a call and bring back the typed up notes to you and then leave them with you to read and then we can meet again after that. Let me know if it's ok to use it or not.

EL: Sure.

DT: OK.

EL: I will do.

DT: Thank you very much.

EL: It's a real pleasure.

DT: Nice talking to you.

DT: Lala, nice talking to you. You have a certain standing as a senior fisherman.

EL: Yeah, I guess. I didn't mean to be one of them but sooner or later I guess.

DT: Sooner or later you become a kupuna.

EL: Kupuna [laugh].

DT: That's how people refer to you so it's a...

EL: Before I used to look up to my grandfather, my dad...

DT: Now you're a kupuna.

EL: A kupuna.

DT: Well it's an honor to spend some time with you. I'll come back again, once I write this up.

EL: Ok. That's fine

DT: Alright. Sounds great and good luck.

EL: Good luck to you. And Cambra should be good to talk to - like I said.

DT: I'll talk to Cambra. I'll do that. I'll talk to Cambra because he would have some good stories, very good knowledge.

EL: Because his knowledge. He's been around. I think he gotta lotta local knowledge.

DT: So yes, he's done plenty of fishing to know...

EL: He's done a lot of bottom fishing.

DT: How old is Cambra, Lala?

EL: I think 60, pretty close to me.

DT: I'll follow up with him. But it's has been a real pleasure meeting with you.

EL: Alright then.

DT: Thank you.

Interview Transcription
Kwanji Fukuyama
August 19, 2008
in Hawi with David Tarnas

DT: (*David describes the proposed project and Cultural Impact Assessment*) You're very much experienced in bottom fishing and trolling, and you know the area well, so what I'd like to do, now that you know the project is just to ask you to describe to me your experience in fishing this area, the type of fishing you do... Just talk a little bit about it. Maybe before you start you could just tell me, were you born here?

KF: Yes I was born here.

DT: Were your parents born here too?

KF: No my parents were from Japan.

DT: They both came from Japan? But you were born here.

KF: I was born here.

DT: In Kohala?

KF: Oh yes, Kohala, but down at camp Hoesa.

DT: Hoesa?

KF: It's Kohala.

DT: Yes. What was your father and mother's name?

KF: Fukuyama. My father was Ataru Fukuyama.

DT: Ataru Fukuyama.

KF: Yeah. My mother was Shizue.

DT: When were you born?

KF: May 17, 1923. So yeah, well I've been fishing basically all my life. Not all yet.

DT: Still have more to go.

KF: Yeah I've got more to go yet. [laugh]

DT: Was your father a fisherman?

KF: Well, as a hobby he liked to go fishing.

DT: But you took it up as a profession?

KF: Not really. I enjoy fishing. I want to stay on the ocean.

DT: When you go fishing what do you usually fish for? Tell me about that.

KF: Well right now I do mostly like only trolling and bottom fishing. Not too much on menpachi anymore, that's night fishing, and akule fishing. That's about it.

DT: Could you describe the types of fishing that you do, and whether you go out of Kawaihae?

KF: Yes.

DT: Could you describe a day in your usual way of fishing, you know if you're going after one type of fish, what would your day be like? If it's a bottom fishing trip what would it be like, or if it's a...

KF: Oh well, bottom fishing, you always want to get out there you know, break of day. The sooner you get out there, the better it is. But like that area you're talking about, we go for onaga and opaka and stuff like that.

DT: Could you describe, as you're coming up from Kawaihae, where would you tend to focus your fishery?

KF: I would say now I'm gonna fish for opaka, I'm going to go closer to Mahukona. And like onaga and stuff like that, I tend to stay closer to Kawaihae, between Black Point and Kawaihae.

DT: What kind of depth do you tend to go for?

KF: I usually fish, like for onaga, around that area, it's anywhere between 130 and 150 fathoms.

DT: So you would be up in this area right in here. 130, 150 fathoms right in here (*pointing to the map*). When you would go fishing, would you troll to your bottom fishing spot and then change gear and go bottom fishing?

KF: You cannot mix. Like I always tell my friend, "Between two chairs, you fall to the ground." You cannot troll and then bottom fishing. You gotta keep your mind on one stuff. Like if your gonna go bottom fishing, you go out there and you do your bottom fish. That's about it, you know. And when you go troll, you just gotta keep at it, you gotta troll.

DT: So if you go bottom fishing, you're coming out of Kawaihae, you would tend to focus on certain areas between Kawaihae and Black Point?

KF: Yes.

DT: For onaga primarily?

KF: Yeah, we have our own spots. They're not all over the place, just certain spots. Partly, I use landmarks and depth recorder. Not much on the GPS. My GPS is landmarks. That's the old style.

DT: Sure you had landmarks and then you use a depth recorder too.

KF: Yes and I go to the area and I fish. Yeah. It's not like the old days though.

DT: Tell me the difference. What have you seen are the changes?

KF: Well, I would say like 20 years ago, you know, I could catch what I want to catch. Now you catch only what the ocean gives you. You can't be too choosy. They're not like that anymore.

DT: So you're saying that 20 years ago you could catch whatever you wanted but now you can only catch what's available.

KF: Yeah. Plus there's less fish all around, yeah? For one thing, like in our area here, the current has changed. It's not like the old days' current. On the old days' current, we just know where to go. But like now, the current is so erratic. Today, bite's down Kawaihae. Next day, bite's way up you know. Like the old days, like in trolling, we can follow the fish. Month by month we can follow the fish right up from Kawaihae, all the way to Mahukona because the current is always the same. But today, oh man. It bites up there one week and bites the other end the other week. It's pretty hard, and not that much fish.

DT: Let's talk about trolling. When you would go trolling what would your target species be?

KF: Mostly ono and mahimahi.

DT: And how would you fish for them? Would you go to a certain depth and follow that? What would be your usual average that you would try to go for?

KF: Well I tend to follow mostly like the opelu ko'as. That's where we troll. But even then I do not fish for opelu but the opelu is so erratic too. And it's... to me there's no ko'a anymore. You know what is a ko'a?

DT: I do.

KF: They move all over the place. They're not around as much as before.

DT: Can you think of what might have caused these changes?

KF: It's hard to say. Current is for one thing. And I think the reproduction is not going too normally. I don't think they are reproducing good.

DT: If you're targeting ono, let's say, you said you try to stay around the ko'a. From what Lala was telling me that's at about 30 fathoms.

KF: 30 to 40 fathoms.

DT: Between 30 and 40 fathoms is that accurate?

KF: Yeah.

DT: Okay, so you would be going closer to shore, you know in the 30 to 40 fathoms. Let's say we're looking at this area, 220+ fathoms. What would be the use of this area off here. You know at that depth, that far from shore, about two and half miles from shore around that depth, what would be the use of that area from a fishing standpoint or anything else?

KF: Well we don't venture that far out because... Well, there's some buoys out there...

DT: Way out there, Double X, Double Z, those are way out, much further.

KF: But, I don't know. Normally we don't fish that far out. On account of the weather, the wind. If they put a cage out there, that might interrupt the natural migration of fish and da kine.

DT: Tell me about it.

KF: Because I fish off the buoys once in a while, but I don't like the buoys. Because the migration don't go the natural way. They stop at a certain point, you know. Yeah, so I don't know how that will affect us because our area of trolling and bottom fishing is limited. Our area is just from Kawaihae, rather Puako, all the way until Mahukona. Now this area (*pointing to area off the Coast Guard Station*)... we don't go out this area very often because of the weather.

DT: So north of Mahukona, up Coast Guard and over here, is that what you are referring to?

KF: Yes, there's a lot of fish there, but we don't normally go up there.

DT: Because of the wind?

KF: Wind and most of the time it's rough.

DT: And the current, the rough waves, the rough seas.

KF: So we always bank on the fish to come this way and go that way, but I don't know how that will affect the cages, though.

DT: I know there has been some experience where the cages do act as fish aggregators.

KF: Yes.

DT: And in other places they have arrangements so the fisherman can fish close to the cages. Do you have any opinions about that?

KF: Yeah, well, by bringing more sharks and stuff. Attracts sharks..

DT: How could this affect your fishing experience? Any of your discussion on that I would appreciate. Your candid opinion, positive or negative, whatever you feel.

KF: It's hard. We have no way of assessing advantage or disadvantage of those things. Until the thing is there, then we gonna know if it affects our fishing or not. Because they gonna feed the fish and a lot of-- some of the food is going out of the cage naturally. That may draw the fish more toward the food, rather than trying to look for fish for themselves. Like I say like the opelu. It's the main source for mahimahi and ono like that. And that supply is depleting.

DT: The opelu supply is depleting.

KF: Yeah. So is akule. It's getting less and less. The fish will move where they can find food. That applies to even bottom fish if you have a cage. So some will go down. So what does that do, affect our fishing? It's hard to say. But I'm against it. To be blunt about it. Because that's gonna attract the sharks also. Now when we go troll every now and then our hook fish, they grab them, the one on the line. Well, yeah, other than that, well...

DT: You think the increase in the number of sharks in the area will increase the number of times per year fish are being taken by the sharks, and so that would affect you.

KF: And you know if food was always available and they are hungrier and hungrier, it might affect the divers and the swimmers if more predators come around.

DT: And your concern really has to do with the change in migration patterns and the sharks. Sounds like the two main issues. One of the things that they have done in other aquaculture farms in the ocean where they have allowed fisherman to fish near the cages because it does act as a fish aggregating device. Do you have any opinions about that?

KF: I don't like the aggregation device.

DT: I understand that.

KF: You see, lotta small ahi and aku get together there. Of course the fisherman they go and take any number of those and now they wondering whether to limit the small ahis. Well they're the ones who put them together there for the people to take. And now they want to control that. That's kind of way out of hand. That's why I don't like the fish devices.

DT: Let's talk about bottom fishing. There's been a lot of changes in bottom fishing over the years.

KF: Yeah, this area is kinda almost wiped out.

DT: Could you talk about that a little bit. What did it used to be like, what kind of species did you used to catch and what do you catch now?

KF: What has brought a big change is technology. In the old days we go by landmark and we all used hand line. 120 fathoms, 130 fathoms, we pull with the hand, so naturally we get enough to bring home we bring home, that's it. But now they have GPS, they have depth recorders. Well I use a depth recorder but I don't use GPS. They go until the thing wiped out. Because they want to make attempts to sell. Naturally it's gonna get wiped out because they don't miss. In the old days for us was hit or miss, so that changed the bottom a lot you know. Like you know last couple of years, one spot in particular, I used to catch onaga like 128, 130 fathom. There's nothing there now.

DT: So do you have to go shallower?

KF: I have to go further out.

DT: Into deeper water?

KF: In deeper water.

DT: So you used to go...

KF: About 128, 130. Now we go 140 up to 150, but we have electric reels to pull up. So you know, like with the electric reels... I use them because I don't want to be left out, sort of you know. Like the old days, you know, you get a hand line, you get tired, you quit. But now you can go whole day, whole night, let the electric reel do the work. So that's why... and the fish comes up faster too.

DT: So technology has really changed...

KF: That changed the fishing plenty.

DT: What kind of fish did you used to fish and what kind of fish do you catch now?

KF: Well they made the bottom fish seasonal so now, you know, it's off season now, so I don't go bottom fishing. But I do some nearshore bottom fish.

DT: And that is about what depth?

KF: Anywhere from 20 to 60.

DT: Fathoms.

KF: Yeah, depending if you go for uku and stuff like that. But fishing is very hard now.

DT: Let's say before when you were going out to 128, 130 fathoms, what species were you targeting?

KF: Onaga.

DT: Primarily onaga or would you go for ehu?

KF: Paka. Would fish them in closer, maybe about 80 to 85.

DT: Okay, so paka was in closer.

KF: In the old days, let's say in the 70s, 70 fathoms. Plenty. And then again, you take only what you... when you get tired you quit. It's hard.

DT: So right now when you do go bottom fishing, when can you go and what do you target? What species do you target now, these days?

KF: When the bottom fish open I go for onaga first.

DT: What is the season now, how is it managed?

KF: It's not going to be open until November, I think.

DT: How long is the season?

KF: As soon as they figure that there is a quota.

DT: Ah, so it's when a certain amount is caught, then they close it...

KF: Then they close it.

DT: How long was the season last year?

KF: Well they opened in September, I think it was, and then they... they opened in September and then they closed it in March or April. But then, this year they closed it a little earlier and then longer...

DT: Yes, so the closed season has been longer this year than last year. What do you think is going to happen?

KF: I don't think that's going to help any. You know why? Because now because the New Year season is coming. That's when most of the bottom fish is good price and you know, people buy that fish. They gonna open in November and I'm telling you the whole state is going to rush and go... Every chance they get they gonna go out there and they going to stay as long as they catch fish and I don't think that's a very good idea. So you can mark my words that they are going to close it much longer next year. Because everybody's waiting for that day and everybody's going to catch and they're going to catch... Because it's going to close, they're going to catch as much as they can. The quota will be reached faster.

DT: Yeah. How many people are out targeting bottom fish? How many fisherman do you think are targeting bottomfish in this area?

KF: In this area? Well, they're targeting quite a bit because they're coming from Honokaa, even Laupahoehoe. They're all coming down this side.

DT: Launch out of Kawaihae?

KF: Yeah, out of Kawaihae. Or they go out of Kona and come up here. So mostly out of Kawaihae. And when they come, naturally they come for the whole weekend. Like we stay here. We go out one day and come back that day. But the outsiders, well you can't blame them... The outsiders are going to stay for the whole weekend and they're going to catch as much as they can.

DT: So have you seen changes in the number of fisherman?

KF: Oh, yes!

DT: Tell me about it.

KF: Oh, plenty.

DT: Plenty of changes, or what do you mean... Plenty of fishermen?

KF: Plenty fisherman. I think more fisherman than fish.

DT: More fisherman than fish.

KF: Yup. I don't know how to guess prices are going to affect among the fisherman from now on. That's another reason that when bottom fish opens, it's going to ruin the fishing, because they don't want to use that much gas.

DT: So when they go bottom fishing, they're going to stay out there...

KF: Stay out there for the whole day.

DT: So when you go bottom fishing do you tend to go to one of your spots and stay there a long time or do you stay for a while... and if it's no good, do you go to the next one?

KF: If it doesn't bite in one spot then I gotta look for another spot.

DT: If you were to look at say this location here, that's where their proposed site is... You don't have to tell me where your grounds are because that's secret and I understand that. But how close would your grounds be to this area here? Just if you could estimate number of miles or something from that area, that's about a mile.

KF: Yeah, probably about a mile in, yeah?

DT: It's about where you would be targeting?

KF: I'd be fishing here. I would be about 140, just about here.

DT: Yup, so it looks like about a mile away. Ok, so you work in this area. Okay. What kind of changes have you seen fishing along in this area in the time that you've been fishing. In terms of number of boats, you said technology has changed. But sort of, could you talk about what you've seen over the years you've been fishing and the changes in this coastline. Sort of what you've seen over the years?

KF: Well, for one thing a little bit pollution, yeah? The water is not as clear as it used to be, so naturally we have to go farther offshore. It's funny but I don't know what happened, but maybe we used to have drier weather, but anytime there's storms, the gulches run down all that dirt you know, and it goes inside the ocean and it stays there for days and days. Like closer to the heiau, the bottom is all muddy.

DT: That's at Puu Kohola.

KF: Yeah. Outside of that is all mud, so when you... even if it doesn't flood, if you have rough weather you can see the discoloration over the whole ocean because it's going to stir it up again and that affects a lot of fishing you know. Because, and I think it does interrupt the spawning. I think the fish had to move away from here to spawn. That's what I think you know. And I guess a lot of people's sewers and stuff seeping through the ground... I don't know that much about it, but the water is not as pure as it used to be.

DT: And you find that there's more fishermen?

KF: Yes. A lot more fishermen.

DT: What do you see them targeting mostly? What are they doing mostly, the fishermen that are out there now?

KF: Oh...

DT: Are they bottom fishing, are they trolling, are they opelu fishing?

KF: They... everybody does mostly about the same type of fishing. Bottom fishing and trolling.

DT: I see, okay.

KF: And I see like I said, our area is limited. Well there's boats going this way and that way, so a lot of boat traffic. Of course that's not very good. Of course everybody wants to catch fish. Because it's an expensive hobby. Like me - I built my own boat and I run them with a 50 horse Suzuki. My gas consumption is not that high in comparison to guys with a big fiberglass boat with two engines. They gotta catch fish to balance their expenses. They have to. And you know if you own a boat you can't leave it idle in the garage all the time. You gotta use it. That's why whether is good fishing or bad fishing, you know, fishermen will go out. No matter what. In the old days when I used to work at the plantation, I work like night shift, 2 to 10. I go out maybe there's only 2, 3 boats out there.

DT: So this is... What year are you talking about? When you were working at the plantation?

KF: Oh, in the 50s and 60s.

DT: So in the 50s and 60s there were only a couple of boats?

KF: On the weekdays, but weekend there's a pile of boats out there. I used to come find my fishing during the week so, well, that's why my catch was pretty good. But now, oh boy, it doesn't make any difference. If they hear the fish is running, weekdays or not, there's just as many boats out there.

DT: And so they are trolling for ono, mahi, but they are also going for bottom fish. Primarily onaga? Or what are they going after?

KF: Like I said everybody's not choosey now.

DT: Whatever you can catch...

KF: If the onaga no bite, you go for opaka. If the opaka no bite, you go for any one of the other seven species.

DT: So you go after whatever bites...

KF: Fishing is very hard now. Well, you... you can't stop the other people, telling them, "Oh you guys interrupting our fishing here." You cannot do that. Like the fishing, the ocean is for everybody. And it's not only for you. When you say it's for everybody, it's everybody. Some people have the idea that the fishing is only for them and they got bad manners. But, other than that, oh well, when you trying to catch fish, you know there's no time to argue and make enemies out there. Because there's all kinds of fishermen. I would say, you know some don't belong fishing, but they try to go out there and try to catch what the other people catch.

DT: From the standpoint of the opelu fisherman, they say, “It’s not near us.” It sounds like your target areas are about a mile away, but still you’ve got the two concerns you brought up: change in the migration of the fish and then the increase of sharks.

KF: *(In written revisions to the transcript approved on September 9, 2008, Mr. Fukuyama added the following words. At the time, there were many articles in the local newspaper about more shark sightings in West Hawaii waters).* After the interview, as I read the paper, - keep out of the water from Keahole to Kawaihae, plenty of sharks patrolling the beaches looking for food. It’s happening because of the fish cage. The sharks get only the smell so they get hungry. It never happened before. Deep sea cage in the bottom will attract the bottom fish deeper (the smell and bits of food). In turn the sharks and predators will feed on the bottom fish. It will be the end of bottom fishing in this area.

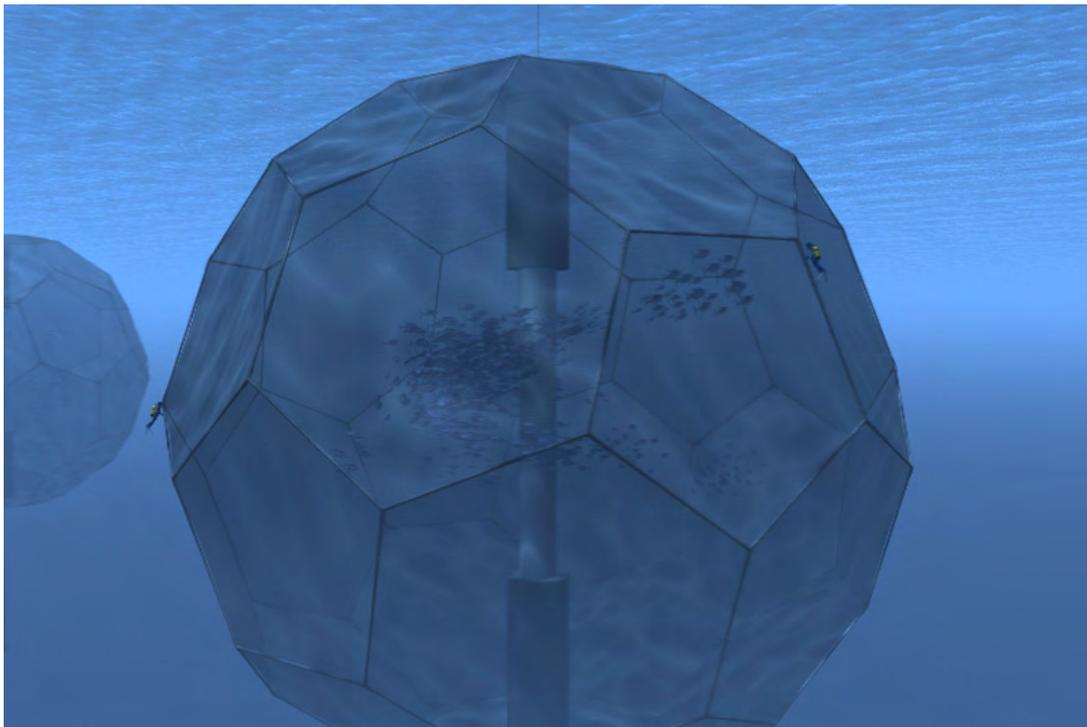
Appendix D

DEIS Comments and Response Letters

As part of the
Final Environmental Impact Statement

for the

**AHI AQUACULTURE PROJECT
KOHALA COAST, HAWAII**



May 25, 2009

Prepared by:

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813
(808) 225-3579

**ADDENDUM TO FINAL ENVIRONMENTAL IMPACT
STATEMENT**

for the

**AHI AQUACULTURE PROJECT
KOHALA COAST, HAWAII**

May 25, 2009

Prepared by:

Hawaii Oceanic Technology

425 South Street, #2902

Honolulu, HI 96813

(808) 225-3579

Section 1

Letters from Government Agencies and Responses

Section 2

Letters from Individuals and Non Government Agencies

Section 1

Letters from Government Agencies and Responses

State of Hawaii
Department of Land and Natural Resources
DIVISION OF AQUATIC RESOURCES

Date:

APR 9 2009

MEMORANDUM

TO: Dan Polhemus, Administrator
FROM: William Walsh, Aquatic Biologist
THRU: Bob Nishimoto, Program Manager
SUBJECT: Comments on Aquaculture Project HA-3496

Comment	Date	Request	Receipt	Referral
		1/30/2009	2/11/2008	2/11/2009

Requested by: Sam Lemmo
Office of Conservation and Coastal Lands
Department of Land and Natural Resources

Summary of Proposed Project

Title: Offshore Aquaculture Facility
Project by: Hawaii Oceanic Technology Inc.
Location: Malae Point, North Kona, Hawaii Island

Comments: We are submitting the following comments with regards to the CDUA permit and lease of state marine waters for the Hawaii Oceanic Technology (HOT) offshore aquaculture facility. There are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world.

In essence, as a production facility, there are a multitude of untried and untested aspects of this project. That being the case, it would seem to be most prudent for the applicant to initially pursue this project as a proof of concept. I do understand from the application that it is proposed to have the number of cages phased in over several years. I would recommend that the CDUA permit explicitly limit (e.g.; 2 cages) the number of cages deployed. Furthermore, it would seem rational to have the cages on site for a period of at least 6 months without any animals or feed to test the effectiveness and reliability of the navigational, propulsion and communication systems as well as cage structural integrity. This trial period will also present an ideal opportunity to test the applicant's emergency response plan.

Subject to a satisfactory independent evaluation and report on the operational efficacy of HOTS cages, stocking the cages for another trial period could commence. Further expansion of operations should be contingent upon successful completion of these trial periods.

LINDA LINGLE
GOVERNOR OF HAWAII



Laura H. Thiele
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

Russell Y. Tsuji
FIRST DEPUTY

Ken C. Kawahara
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

STATE OF HAWAII 2009 APR 17 A 8:13
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
74-380 B Kealahou Parkway
Kailua-Kona, Hawaii 96740
808-327-6226
darofc@hawaiiintel.net
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 15, 2009

Aloha Dawn,

Per our conversation this afternoon, I am submitting the following comments with regards to the CDUA permit and lease of state marine waters for the Hawaii Oceanic Technology (HOT) offshore aquaculture facility. There are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world.

In essence, as a production facility, there are a multitude of untried and untested aspects of this project. That being the case, it would seem to be most prudent for the applicant to initially pursue this project as a proof of concept. I do understand from the application that it is proposed to have the number of cages phased in over several years. I would recommend that the CDUA permit explicitly limit (e.g.; 2 cages) the number of cages deployed. Furthermore, it would seem rational to have the cages on site for a period of at least 6 months without any animals or feed to test the effectiveness and reliability of the navigational, propulsion and communication systems as well as cage structural integrity. This trial period will also present an ideal opportunity to test the applicant's emergency response plan.

Subject to a satisfactory independent evaluation and report on the operational efficacy of HOTs cages, stocking the cages for another trial period could commence. Further expansion of operations should be contingent upon successful completion of these trial periods.

Sincerely,

William J. Walsh, PhD.

May 22, 2009

Dr. William Walsh
State of Hawaii
Department of Land and Natural Resources
Division of Aquatic Resources
74-380 B Kealakehe Pkwy.
Kailua-Kona, HI 968740

Dear Dr. Walsh,

Thank you for your thoughtful comments regarding our project.

First let me assure you that we have carefully reviewed a range of hardware that has already been tried and tested in other applications in particular the US Navy and the offshore oil drilling industry. Virtually all aspects of the structural design of our systems are available commercially off the shelf. Our goal is to adapt these technologies to fish production.

We are planning on conducting several tests of our methodology for the hatchery process and the Oceansphere before the introduction of tuna stocks. The technology path will include a phase where we will complete the lifecycle of the tuna from "hatchery to plate" using available grow out technology, in land tanks at UH Hilo PACRC or possibly NELHA. Then we will move on to a small test version of the Oceansphere which will be tested for sea worthiness at our lease site and modified as appropriate before we introduce a limited number of tuna to the cages. This test Version will be smaller scale as described on pp. 1-9 of the FEIS. The goal of this version will be to prove out the technology and serve as an operational pilot. After successfully testing we will build and test a full scale Oceansphere and will allow us to implement improvements in the technology and lessons learned. The full scale Oceansphere and is planned to be the long range workhorse for the Ahi Aquaculture project moving forward.

We have already engaged Science Application International to do an independent evaluation and report on optimal technologies to be considered before the full scale Oceansphere is fully designed and implemented for sea trials. All components of the system will be thoroughly evaluated on the basis of marine capability, duration of operation, capex and overall long term functionality.

Sincerely,


William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

CC: Dan Polhemus, Administrator
Bob Nishimoto, Program Manager
State of Hawaii, DLNR, DAR, OCCL, PO BOX 621, Honolulu, HI, 96809

LINDA LINGLE
GOVERNOR



BRENNON T. MORIOKA
DIRECTOR

RECEIVED
DEPARTMENT OF CONSERVATION
NATURAL LANDS
Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
TOD A. SUMADA
2009 MAR -9 A 11: 02
IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
STATEWIDE TRANSPORTATION PLANNING OFFICE
869 PUNCHBOWL STREET, ROOM 404
HONOLULU, HAWAII 96813-5097
TELEPHONE (808)587-1845; FAX (808)587-2362
OFFICE OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FACSIMILE TRANSMITTAL

DATE: 3/9/9

NO. OF PAGES (Including Cover Sheet): 3

TO: Samuel Lemmo FAX No.: 587-0322
DLNR

FROM: SUSAN PAPUGA Phone No.: 587-1845

SUBJECT: CDUA

COMMENTS: Advance Copy

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

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2009 MAR 10 A 11: 56

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
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IN REPLY REFER TO:

STP 8.3154

March 6, 2009

TO: MR. SAMUEL J. LEMMO, ADMINISTRATOR
OFFICE OF CONSERVATION AND COASTAL LANDS
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: BRENNON T. MORIOKA 
DIRECTOR OF TRANSPORTATION

SUBJECT: PROPOSED CONSERVATION DISTRICT USE APPLICATION (CDUA)
AND REQUEST FOR LEASE FOR MARINE WATERS FOR THE HAWAII
OCEANIC TECHNOLOGY, INC. (HOT) AQUACULTURE PROJECT,
OFFSHORE WATERS OF MALAE POINT, NORTH KOHALA, ISLAND OF
HAWAII

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project to develop a commercial aquaculture project.

DOT understands that the subject project involves leasing an approximately 247-acre off-shore area located 3 miles southwest of Malae Point in the North Kohala area, where untethered Oceanspheres will be deployed to culture yellow fin and bigeye tuna. Additionally, the project proposes operations at State commercial harbors, Kawaihae Commercial Harbor and Hilo Harbor. The shoreside operational facilities, vessels and staff are proposed to be located in Kawaihae Harbor and the tuna products may be transhipped through Kawaihae or Hilo Harbors.

Given the potential impacts to the State commercial harbors, particularly to Kawaihae Commercial Harbor, the following comments by the DOT Harbors Division are offered.

1. Kawaihae Commercial Harbor's berths and operational areas are extremely congested. The Harbors Division has just started the Hawaii Island Commercial Harbors 2035 Master Plan planning process. The requirements of the proposed project should be addressed in that effort.
2. Request that the applicant begin consultation with Mr. Dean Watase of the DOT Harbors Division Planning Section, telephone no. (808) 587-1883, regarding the use of the State harbors.

Mr. Sam J. Lemmo
Page 2
March 6, 2009

STP 8.3154

DOT appreciates the opportunity to provide comments. If there are any other questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at (808) 587-2356.

May 25, 2009

Brennon Morioka
Director, State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Morioka,

Thank you for your letter of March 6, 2009 providing comments on the Draft Environmental Impact Statement for the proposed ahi aquaculture project off the Kohala Coast on the island of Hawaii. A response to each of your comments (which are highlighted in bold face type) is provided after each comment.

1. "Kawaihae Comm. Harbor's berths and operational areas are extremely congested. DOT Harbors Division just started the Commercial Harbors 2035 Master Plan planning process. The requirements of the proposed project should be addressed in that effort....

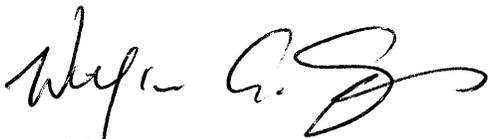
When we started planning for this project we met with Ian Birnie, now retired as District Administrator for Commercial Harbors on this island. Since this time, we have also contacted Mr. Birnie's replacement to inquire further about Kawaihae Harbor. At the invitation of Mr. Dean Watase, we attended the May 20, 2009 stakeholders' meeting for the 2035 master plan and presented the requirements of the proposed project at that time.

2. Applicant should begin consultations with Dean Watase at 587-1883."

We have contacted Mr. Dean Watase and at his invitation, attended the May 20, 2009 Kawaihae Harbor stakeholders meeting. We will continue to work closely with Harbor management as the project progresses.

Thank you for your comments and we look forward to working with you and your departmental staff on this project.

Sincerely,



William A. Spencer
CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS

2009 MAR 25 A 11: 01 in reply, please refer to:
EPO-09-026

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

March 20, 2009

Mr. Samuel J. Lemmo, Administrator
State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

SUBJECT: CDUA HA-3496
Draft Environmental Impact Statement and Conservation District Use Application
for Ahi Aquaculture Project
Kohala Coast, Island of Hawaii, Hawaii

Thank you for allowing us to review and comment on the subject application. The application was routed to the various branches of the Environmental Health Administration. We have the following Clean Water Branch and General comments.

Clean Water Branch

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at

<http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf>.

1. Any project and its potential impacts to State waters must meet the following criteria:
 - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

- c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. You should specify if any impacted State waters are listed in the Clean Water Act, Section 303(d) list of impaired water bodies in Chapter IV of the *2006 State of Hawaii Water Quality Monitoring and Assessment Report*.

Any NPDES permit(s) for discharges into these water bodies will incorporate the requirement for the Permittee to develop and implement a facility/project-specific Waste Load Allocation (WLA) implementation and monitoring plan when a Total Maximum Daily Load (TMDL) which specifies WLAs applicable to the Permittee's project is approved by the U.S. Environmental Protection Agency. The Permittee shall incorporate and implement the facility/project-specific WLA implementation and monitoring plan as part of the project's Storm Water Pollution Control Plan or Site-Specific Best Management Practices Plan, as appropriate. The facility/project-specific WLA implementation and monitoring plan shall include Data Quality Objectives (DQO) and Quality Assurance and Quality Control methods. The purpose and goal of DQO process can be found at <http://www.hanford.gov/dqo>. Information on the DOH WLA Implementation and TMDLs are available on the DOH Environmental Planning Office website at <http://hawaii.gov/health/environmental/env-planning/wqm/wqm.html> (see *TMDL Technical Reports and Implementation Plans for approved TMDLs are available here for download in pdf format*).

3. For types of wastewater discharges not covered by an NPDES general permit, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html>.
4. For the Pacific Aquaculture and Coastal Resource Center, if there are discharges of process wastewater associated with the hatchery activities to State waters, an NPDES individual permit may be required.
5. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 Water Quality Certification are required, must comply with the Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

If you have any questions, please visit our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>, or contact the Engineering Section, CWB, at 586-4309.

Mr. Lemmo
March 20, 2009
Page 3

General

We strongly recommend that you review all of the Standard Comments on our website:
www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this project should be adhered to.

If there are any questions about these comments please contact Jiakai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kelvin H. Sunada', with a long horizontal line extending to the right.

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
CWB
EH-Hawaii

May 25, 2009

Kelvin Sunada
Environmental Planning Office
Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Mr. Sunada,

Thank you for your 3-20-09 letter providing comments on the Draft EIS for the proposed ahi aquaculture project. This letter provides responses following each of your comments, which have been highlighted in bold face type.

1. The DOH Clean Water Branch notes that we must show that the project meets criteria in "antidegradation policy" (HAR 11-54-1.1) designated uses (HAR 11-54-3) & water quality (HAR 11-54-4 through 11-54-8).

Oceansphere operations will not cause degradation to the surrounding water quality. The project meets criteria in "antidegradation policy" (HAR 11-54-1.1) designated uses (HAR 11-54-3) & water quality (HAR 11-54-4 through 11-54-8). An effluent model and resulting water quality parameters are discussed in section 2.3 of the Draft EIS and is compliant with water quality standards for Class A marine waters.

2. The DOH CWB also notes that we must "...specify if any impacted State waters are listed in the Clean Water Act, Section 303(d) list of impaired water bodies in 2006 DOH report

The FEIS notes that there are no impaired water bodies that will be affected by this proposed project.

3. Any NPDES permit(s) for discharges in these waters will require permittee to develop and implement WLA implementation and monitoring plan For types of discharges not covered by NPDES general permit, the project may need a NPDES individual permit

We understand that the State Department of Health Clean Water Branch (DOH-CWB) requires a revised National Pollutant Discharge Elimination System (NPDES) Permit and Zone of Mixing Permit (ZOM) under the Federal Clean Water Act, Section 402, and HAR 11-55. This applies specifically to discharges of point sources of pollutants into surface waters of the U.S. All aquaculture projects - including offshore net pen culture - are considered point-sources. A NPDES permit application will be submitted to CWB. Hawaii Oceanic Technology will prepare the required WLA implementation and monitoring plan as part of the NPDES permit process.

If required, we will prepare and submit an NPDES individual permit as you describe.

4. For the Pacific Aquaculture and Coastal Resource Center, if there is any discharge of process wastewater to State waters, an NPDES individual permit may be required.

The project will consult with PACRC and CWB to determine if a separate NPDES is required for PACRC.

5. All discharges from project construction and operations, whether or not a NPDES or Sec. 401 WQ Cert is required, still must comply with Water Quality Standards.

We understand that all discharges from project construction and operations must comply with Water Quality Standards.

Thank you for your comprehensive comments on the DEIS. We look forward to working with you through the NPDES process.

Sincerely,



William A. Spencer
CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

William P. Kenoi
Mayor



BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

County of Hawai'i

PLANNING DEPARTMENT

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

May 13, 2009

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
State of Hawai'i
PO Box 621
Honolulu, HI 96809

Dear Mr. Lemmo:

Subject: Proposed Conservation District Use Application (CDUA) and Request for Lease for Marine Waters
Project: Hawai'i Oceanic Technology, Inc. Aquaculture Project
Location: Offshore Waters of Malae Point, North Kohala, Hawaii

This letter is prepared in response to correspondence dated February 5, 2009, requesting comments from this office regarding the proposed Conservation District Use Application (CDUA HA-3496). We apologize for our delay in responding to this request.

The proposed marine waters lease is located 2.6 nautical miles offshore and is not within County of Hawai'i jurisdiction. However, the proposed land base of the operations will be located within the Kawaihae Harbor. The majority of Kawaihae Harbor is zoned MG-1a (General Industrial-1 acre minimum lot size); the only exception is the breakwater which is zoned as Open by the County of Hawaii. The proposed land base would be situated within the State Land Use Urban District. In addition, the Kawaihae Harbor is located entirely within the Special Management Area (SMA).

Please note that the proposed CDUA contains conflicting information regarding the land base located within Kawaihae Harbor. Page 30 of the application states that "There will be no construction as part of this project and all land-based facilities would be at existing facilities". However, Attachment 4, the Business Plan, under the heading of Day to Day

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
State of Hawai'i
Page 2
May 13, 2009

Operations, the application states that "The company will lease an area of undeveloped land within the Kawaihae Harbor and build its own office and work yard."

According to Planning Commission Rules of Practice and Procedures, Section 9-8 "*no development shall be allowed within the SMA without obtaining a permit in accordance with this rule.*" Any proposed construction within the Kawaihae Harbor would need to receive SMA approval from our office.

We have no further comments to offer at this time.

If you have any further questions or if you need further assistance, please feel free to contact Bethany Morrison of this office at 961-8288, extension 252.

Sincerely,



BJ LEITHEAD TODD
Planning Director

BJM:cs

P:\wpwin60\Bethany\General Zoning Inquiries\OCCLHawaiiOceanicTechnologiescomments.doc

cc: Planning Department- Kona

May 22, 2009

BJ Leithead Todd
Planning Director
Hawaii County Planning Department
101 Pauahi Street, Suite 3
Hilo, HI 96720

Thank you for your comments on the Proposed Draft EIS for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project of May 13, 2009.

We note your conclusion concurs with the DEIS that the offshore ocean lease site is outside County jurisdiction.

Regarding land operations at Kawaihae Commercial Harbor, your letter explains the zoning for the harbor, which is MG-1a, and that it is entirely in the SMA. You note that any new construction in the harbor will require SMA approval from your department.

Thank you for making sure we understand this. The FEIS explains that if no building is available for lease at Kawaihae Commercial Harbor for our land base of operations, then the company would need to lease undeveloped land at the harbor and make improvements to build an office and storage areas. The FEIS states that any new construction such as this would require a SMA permit and necessary building permits.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a stylized flourish at the end.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

William P. Kenoi
Mayor



RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

SAM

Diane L. Ley
Interim Deputy Director

2009 MAR -9 A 8:03

County of Hawaii
DEPT. OF LAND & NATURAL RESOURCES
DEPARTMENT OF RESEARCH AND DEVELOPMENT
25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8366 • Fax (808) 935-1205
E-mail: chresdev@co.hawaii.hi.us

FAX TRANSMITTAL

FAX #: 587-0390 DATE: March 6, 2009

TO: Draft Environment Impact Statement FROM: Diane Ley, Deputy Director
for
Abi Aquaculture Project, Kohala Coast, Hawaii

MESSAGE: To: Laura Thielan, Chair BLNR
Sam Lemmo

The information contained in this facsimile message is attorney privileged and confidential information intended only for the use of the individual or entity named above. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please immediately notify us by telephone and return the original of this transmittal to us at the above address via the U.S. Postal Services. Thank you.

TOTAL NO. OF PAGES (INCLUDING THIS TRANSMITTAL SHEET): _____

If you do not receive all pages, please call (808) 961-8366 as soon as possible.

_____ Hard copy to follow Sent by: _____

William P. Kenoi
Mayor



Randall M. Kurohara
Director

Diane L. Loy
Deputy Director

County of Hawaii

DEPARTMENT OF RESEARCH AND DEVELOPMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8366 • Fax (808) 935-1205
E-mail: chresdev@co.hawaii.hi.us

March 6, 2009

Bill Spencer, Chief Executive Officer
Hawai'i Oceanic Technology
425 South King Street, Suite 2902
Honolulu, Hawai'i 96813

RE: Ahi Aquaculture Project
North Kohala, Island of Hawai'i
Draft Environmental Impact Statement

Dear Mr. Spencer:

Thank you for providing the County of Hawai'i's Department of Research and Development with an opportunity to offer comments on the Draft Environmental Impact Statement (DEIS) for the proposed Ahi Aquaculture Project in North Kohala, Island of Hawai'i. The Department's comments follow:

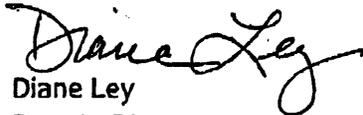
1. The DEIS acknowledges that open ocean aquaculture is a relatively new technology, and the scale of operation is quite substantial; therefore, the Department recommends that an independent entity conduct the water quality monitoring to ensure compliance with the required National Pollution Discharge Elimination System permit.
2. Tuna are usually grown-out in surface cages, rather than submerged cages, and the proposed technology for the cages is yet to be proven. If it is determined later that a surface cage system will be used, a new environmental review should be required.
3. The DEIS is not completely clear as to whether the harvested fish will be processed by the applicant or by third parties. There was lack of detail regarding the processing plant(s), its inputs (labor, power, freshwater, etc.) and its effluents and by-products. The operation may produce over 2,000 tonnes of offal per year. There is a substantial opportunity for this material to be further processed into fishmeal or fertilizer.

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DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Bill Spencer
Hawai'i Oceanic Technology
March 6, 2009
Page 2.

Again, thank you for this opportunity to provide comments.

Sincerely,



Diane Ley
Deputy Director

C: Laura Thielen, Chair Board of Land & Natural Resources
Samuel Lemmo, Administrator Office of Conservation & Coastal Lands, DLNR
George Redpath, Tetrattech
Office of Environmental Quality Control

May 20, 2009

Diane Ley, Deputy Director
County of Hawaii
Department of Research and Development
25 Aupuni St., Room 109
Hilo, Hawaii 96720-4252

Dear Ms. Ley,

Thank you for your letter of March 6, 2009 regarding our Ahi Aquaculture Project, North Kohala, Island of Hawaii.

I will highlight your question in bold and put our answer after it for easy reference.

- 1. The DEIS acknowledges that open ocean aquaculture is a relatively new technology, and the scale of operations quite substantial; therefore, the Department recommends that an independent entity conduct the water quality monitoring to ensure compliance with the required National Pollution Discharge Elimination System permit.**

Hawaii Oceanic Technology, Inc. agrees and is willing to contract with an independent third party laboratory to conduct water quality monitoring to assure compliance.

- 2. Tuna are usually grown-out in surface cages, rather than submerged cages, and the proposed technology for the cages is yet to be proven. If it is determined later that surface cage system will be used, a new environmental review should be required.**

Although you state the proposed technology is yet to be proven, the fact is that most components of our technology solution have been proven in other industries such as the oil industry where oil drilling platforms are unmanned and kept in geo-static position using similar techniques. The U.S. Navy has a variety of unmanned underwater vehicles and buoy observation stations that use similar telemetry systems to keep their buoys on station. Catch and fatten tuna operations such as those you mention have high stocking densities and may encourage disease and escapes. It is highly unlikely that we will shift our technology focus in that direction. However should that happen, we agree that a new environmental review should be undertaken.

- 3. The DEIS is not completely clear as to whether the harvested fish will be processed by applicant or by third parties. There was lack of detail regarding the processing plant(s), its inputs (labor, power, freshwater, etc.) and its effluents and by products. The operation may produce over 2,000 tons of offal per year. There is substantial opportunity for this material to be further processed into fishmeal or fertilizer.**

Our intention is laid out on page 2.72 of the DEIS. We intend to contract with a HACCP approved fish processing facility in Kona. The waste stream consisting primarily guts and gills (representing about 20% of the total body weight or 1,200 tons per year). We have asked the fish processing company to work with other local businesses to reuse this valuable by-product for cattle feed, bio-diesel (if such facilities are built by then) or possibly processed into nutraceuticals including Omega 3 and 6 fatty acids which can be used to supplement our own fish feed. Our intention is that none of our waste be introduced into the Big Island landfills. We have a letter of intent from a local cattleman's association as well as verbal requests from ranchers in North Kohala.

Thank you for the opportunity to respond to your thoughtful questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBAY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

OFFICE OF PLANNING

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

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12459

March 3, 2009

To: Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources

From: Abbey Seth Mayer, Director
Office of Planning

Subject: Proposed Draft Environmental Assessment for Proposed Hawaii Oceanic
Technology, Inc. Ahi Aquaculture Project
Offshore Waters of Malae Point, North Kohala, Island of Hawaii

2009 MAR -5 A 10: 35
OFFICE OF PLANNING
&
CONSERVATION
DISTRICT USE
APPLICATIONS
DIVISION
STATE OF HAWAII
CONSERVATION
&
COASTAL
LANDS

Thank you for sending the Office of Planning (OP) a copy of the Draft Environmental Assessment (EA) and Conservation District Use Application (CDUA) for the above referenced Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project.

In Hawaii, the lead agency to implement or coordinate the State's federally approved Coastal Zone Management (CZM) Program is the Office of Planning. Hawaii's coastal zone encompasses all of Hawaii's land area and ocean area extending from the shoreline to the seaward limit of the State's police power and management authority. The Hawaii CZM area also includes all archipelagic waters and submerged lands to the limit of the State's jurisdiction. Federal lands are excluded from the Coastal Zone.

The CZM Program Federal Consistency review is triggered by one of three types of activities: (1) specific use of federal funds, (2) federal actions, or (3) federal licenses or permits. According to the description of the proposed ahi aquaculture project, the proposed project would require a federal permit (i.e. Department of the Army Permit), and therefore a CZM federal consistency review would be required.

The Office of Planning asks that the Final EA provide a discussion on how the proposed activities and actions are consistent with the enforceable policies in the context of the CZM objectives and policies. Commercial and sport fishing organizations should also be asked to comment on this project. If you have any questions, please call the Land Use Division at 587-2842.

May 20, 2009

Abbey Seth Mayer, Director
Office of Planning
Department of Business, Economic Development & Tourism
Office of Planning 235 South Beretania St, 6th Floor
Honolulu, HI 96813

Dear Ms. Mayer,

Thank you for your comments on the Proposed Draft EIS for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project of March 3, 2009.

Thank you for pointing out that the CZM Program Federal Consistency review is triggered by activities including but not limited to federal licenses or permits. Since the proposed operation will be in State territorial waters, the only federal permit that might be anticipated would be from the Department of the Army, Corp of Engineers. Since our proposed open ocean aquaculture platforms are geostatically positioned vessels, and will not be tethered to the ocean floor, the Army Corp of Engineers will review our Conservation District Use Permit, and determine if a federal permit is required. This decision will be determined at a later date once State permits have been issued.

As per your request, the Final Environmental Impact Statement includes a discussion of how the proposed activities and actions are consistent with the enforceable policies in the context of the CZM objectives and policies. As described in the DEIS, we have given presentations and received input from fishermen, and those representing fishing organizations, since they have attended both the West Hawaii Fishery Council meetings, and the Kawaihae Local Resource Council meetings. We will continue this consultation as you suggest and request to meet with the commercial and sport fishing organizations separately.

Thank you for your comments on the Draft Environmental Impact Statement and Conservation District Use Application.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

LINDA LINGLE
Governor



State of Hawaii
DEPARTMENT OF AGRICULTURE
Aquaculture Development Program
1177 Alakea Street #400
Honolulu, Hawaii 96813

SANDRA LEE KUNIMOTO
Chairperson, Board of Agriculture

DUANE K. OKAMOTO
Deputy to the Chairperson

E-mail: info@hawaiiacquaculture.org
http://www.hawaiiacquaculture.org

Tel: (808) 587-0030
Fax: (808) 587-0033

March 6, 2009

Mr. Samuel J. Lemmo
Administrator
DLNR/Office of Conservation and Coastal Lands
Post Office Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

Thank you for requesting the Aquaculture Development Program to review Hawaii Oceanic Technology's (HOT) proposed Conservation District Use Application and Request for Lease.

The proposed HOT project is very forward thinking and has the potential to significantly impact the Hawaii's economy. The fundamental aspects of HOT's environmental impact statement has fulfilled what was requested by the various State and Federal representatives at the two scoping meetings. In addition, HOT's community outreach program, with Mr. David Tarnas, is very impressive.

The Aquaculture Development Program strongly supports this project.

Sincerely,

Todd Low
ADP Manager

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DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII



May 20, 2009

Todd Low, Manager
Aquaculture Development Program
1177 Alakea St., #400
Honolulu, HI 96813

Dear Mr. Low,

Thank you very much for your strong March 6, 2009 letter of support of Hawaii Oceanic Technology's proposed Conservation District Use Application and Request for Lease.

We are grateful for the advice and support provided by your staff, in particular, Leonard Young, who has been very helpful on a number of fronts including arranging two scoping meetings that were critical to our efforts.

Thank you also for agreeing that our Draft Environmental Impact Statement has fulfilled what has been requested by the various State and Federal agencies that participated in the scoping meetings. We also agree that Mr. David Tarnas has done an impressive job of supporting our community outreach efforts and communicating well with local stakeholders..

We look forward to continuing to work with the Aquaculture Development Program and consider it to be an extremely valuable resource for helping grow the aquaculture industry in Hawaii.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

William P. Kenoi
Mayor



Lono A. Tyson
Director

Ivan M. Torigoe
Deputy Director

County of Hawai'i

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 • Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

February 18, 2009

Mr. Samuel J. Lemmo
Administrator
Office of Conservation and Coastal Lands
State of Hawai'i
DLNR
P. O. Box 621
Honolulu, HI 96809

2009 FEB 24 A 10: 10
RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
STATE OF HAWAII

RE: Proposed Conservation District Use Application (CDUA) and Request for Lease For Marine Waters for the Hawai'i Oceanic Technology, Inc. Aquaculture Project, Offshore Waters of Malae Point, North Kohala, Island of Hawai'i

Dear Mr. Lemmo,

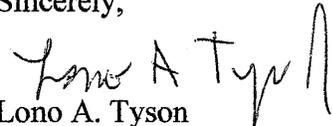
We offer the following comments:

Solid Waste Division

Submission of a Solid Waste Management Plan will be required for this project. Guidelines are enclosed.

Thank you for allowing us to review and comment on this project.

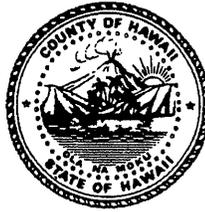
Sincerely,


Lono A. Tyson
DIRECTOR

enclosure: Solid Waste Management Plan Guidelines

cc: SWD

William P. Kenoi
Mayor



Lono A. Tyson
Director

Ivan Torigoe
Deputy Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 • Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

February 12, 2009

SOLID WASTE MANAGEMENT PLAN
Guidelines

INTENT AND PURPOSE

This is to establish guidelines for reviewing solid waste management plans, for which special conditions are placed on developments. The solid waste management plan will be used to: (1) promotes and implement recycling and recycling programs, (2) predict the waste generated by the proposed development to anticipate the loading on County solid waste management facilities, and (3) predict the additional vehicular traffic being generated because of waste and recycling transfers. A qualified consultant shall prepare a suitable solid waste management plan for review by the Department of Environmental Management.

REPORT

The Solid Waste Management Plan will contain the following:

1. Description of the project and the potential waste it may be generating: i.e. analysis of anticipated waste volume and composition. This includes waste generated during the construction and operational or maintenance phases. Waste types shall include (but not be limited to):
 - A. Organics (including food waste and green wastes);
 - B. Construction and Demolition;
 - C. Paper (including cardboard);
 - D. Metal (including ferrous and non-ferrous metals);
 - E. Plastic;
 - F. Special (including ash, sludge, treated medical, bulky items, tires);
 - G. Household Hazardous (including paint, vehicle fluids, oil, batteries); and
 - H. Glass.
2. Indicate onsite source separation facilities by waste type; i.e. source separation bins of glass, metal, plastic, cardboard, aluminum, etc. Provide ample and equal space for rubbish and recycling.
3. Identification and location of the proposed waste reduction, waste re-use, recycling facility or disposal site and associated transportation methods for the various components of the development's waste management system, including the number of

May 20, 2009

Lono A. Tyson, Director
County of Hawaii
Department of Environmental Management
25 Aupuni St.
Hilo, HI 96720

Dear Mr. Tyson,

Thank you for your letter of February 18, 2009 regarding the submission of a Solid Waste Management Plan for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project.

Please note that we fully intend to comply with all County of Hawaii requirements for waste management. As you describe in your letter, we will prepare and submit a Solid Waste Management Plan for this project, following the guidelines you sent.

Thank you for providing this information to our company.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

4400

FAX TRANSMITTAL SHEET

ENVIRONMENTAL CENTER
University of Hawaii
2500 Dole Street, Krauss Annex 19, Honolulu, HI 96822
Telephone: (808) 956-7361 Fax: (808) 956-3980

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2009 APR 14 A 9:21
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

DATE: 4/9/2009

FROM: Peter Rappa
Environmental Review Coordinator

TO: Laura Thielen, DLNR OCCL (587-0390)
George Redpath, Tetrattech (533-3306)
Bill Spencer, Hawaii Oceanic Technology (528-4751)
OEQC (586-4186)

SUBJECT: REVIEW OF DRAFT EIS
AHI AQUACULTURE PROJECT
NORTH KOHALA, HAWAII

No. of Pages: including cover sheet: 7



U.S. DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Pacific Islands Regional Office
 1601 Kapiolani Blvd., Suite 1110
 Honolulu, Hawaii 96814-4733
 (808) 944-2200 • Fax: (808) 973-2941

Samuel J. Lemmo, Administrator
 Office of Conservation and Coastal Lands
 P.O. Box 621
 Honolulu, HI 96809

2009 MAR -6 A 8:28
 RECEIVED
 OFFICE OF CONSERVATION
 AND COASTAL LANDS
 DEPT. OF LAND &
 NATURAL RESOURCES
 STATE OF HAWAII
 MAR 5 2009

Mr. Lemmo,

The NOAA Fisheries Pacific Islands Region's Protected Resources Division (PIR PRD) provides the following comments regarding the Proposed Conservation District Use Application and Request for Lease of Marine Waters for the Hawaii Oceanic Technology, Inc. Aquaculture Project, Offshore Waters of Malae Point, North Kohala, Island of Hawaii (CDUA HA-3496).

The accompanying Draft Environmental Impact Statement (DEIS) prepared for this project contains information on marine protected species known to occur within the proposed project area and the anticipated impacts to these species resulting from installation and operation of the aquaculture pens. PIR PRD agrees that there will likely be less than significant impacts to all marine turtle species that occur in the project area. These comments are therefore focused on the anticipated impacts to marine mammals, in particular to humpback whales (*Megaptera novaeangliae*), dolphin species, and the Hawaiian monk seal (*Monachus schauinslandi*). Potential impacts that are of concern include acoustic impacts, entanglement, shark attraction, and provisioning of marine mammals.

Acoustic impacts may result from installation of the pens and from the daily operations of boats that work on them. There may also be acoustic impacts from the engines of the Oceanspheres' positioning system. There is no information provided in the CDUA or the DEIS on operational decibel levels of these engines so that we may assess the potential for acoustic impacts to marine mammals. We ask that you provide a complete acoustic impact analysis of the engines' operations as well as the installation and operations of the aquaculture project on marine mammals.

There appear to be no entanglement issues that would result from the use of tethers to anchor the Oceanspheres in place, since they are free-floating structures; however, the DEIS states that the pens will be marked by buoys and lights (pg. 2-29 par. 2). We ask that you provide information on how these marking devices will be anchored or tied into the pens themselves so that we may assess the likelihood of entanglement. There is also concern that marine mammals may become entangled in the netting of the pens. Dolphins have been known to inadvertently hook their teeth into netting as they attempt to get at the fish inside the pens, which can result in injury or drowning. Please provide additional information on the potential for entanglement in the netting.

It is acknowledged in the DEIS that sharks are attracted to the Kona Blue Water Farms (KBWF) aquaculture pens, and that they are seen by their divers on a regular basis (pg. 2-49, par. 1). It is



also known that bottlenose dolphins (*Tursiops truncatus*) have been attracted to these pens and are observed on a daily basis. We are concerned that the combined attraction of these species, as well as the potential for Hawaiian monk seals to be attracted to the pens (CDUA pg. 40, par. 2), could result in increased predation on dolphins and seals by sharks.

The KBWF aquaculture pens clearly act as Fish Attraction Devices (FADs) due in part to the release of excess feed and waste products, as well as the simple fact that they are floating structures in the open ocean. The fish that are attracted to the pens in turn attract other large predators and have been documented to attract bottlenose dolphins, which feed on fish attracted to the outside of the pens. We are concerned that this has resulted in a form of provisioning that has significantly changed the dolphins' feeding behavior. This behavior can be transferred to other individuals, and we are concerned that increasing numbers of dolphins may learn this behavior. We have had reports that there are as many as 6 or 7 dolphins now seen on a daily basis at the KBWF pens, and that this number has increased over the years from only 1 or 2 dolphins. These dolphins were initially attracted to the pens by an unintentional fish escape, reported as a poaching incident, and an employee had also been discovered to have been feeding the dolphins. However, the potential is great for the Oceanspheres to also act as FADs and create an attraction for dolphins or other marine mammal species.

The DEIS initially states that two species of cetaceans are known year-round residents of the Hawaiian Islands (pg. 2-50, par. 2). However, the DEIS later states that other delphinid species including spotted dolphins, short-finned pilot whales, and pygmy killer whales have been observed in the project area (pg. 2-62, par. 5). We would add that false killer whales are known to reside within the project area. Please include an analysis of the effects of this project on these additional cetacean species.

The DEIS correctly states that "no systematic surveys have been done to document the presence or absence of dolphins and other toothed whale species, or potential increases in dolphin numbers or residency around the KBWF platforms" (pg. 2-63, par. 2). However, the KBWF has a Marine Mammal Monitoring Plan in place that has documented the afore-mentioned aggregation of bottlenose dolphins at their pens. While this is not a systematic survey in strict scientific terms, it certainly provides undisputed evidence that several dolphins seem to have taken up residency at the KBWF pens, and this information can be used to infer similar impacts would occur at the proposed aquaculture site.

The Factors Considered for Impact Analysis on page 2-56 of the DEIS were used to determine whether the impacts of the project would be significant. These factors include, among others, 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; and if there would be "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. The definition of "take" under the MMPA means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. The term "harassment" means any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing,

nursing, breeding, feeding, or sheltering. The potential for this project to result in alteration of certain marine mammals' feeding behavior is, in our opinion, very high and could rise to the level of a take as defined under the MMPA.

Based upon the concerns previously raised in this letter, we disagree with the assertion in the DEIS that all outcomes on marine mammals are unknown and therefore the impacts will be less than significant to marine mammals (DEIS pg. 2-65, par. 2). We also disagree with the assertion in the CDUA that there are no data available to support any conclusions on either short-term or long-term behavioral impacts to larger marine wildlife species (CDUA, pg. 16 par. 2). The establishment of a monitoring program is relied upon to identify and minimize adverse effects to marine mammals, but there is no explanation of how the operations could be modified to reduce or eliminate those impacts which have already been identified to occur at the KBWF aquaculture site.

Thank you for the opportunity to provide comments on this application and the supporting DEIS. If you have any questions regarding these comments, please contact Jayne LeFors of my staff at (808) 944-2277 or jayne.lefors@noaa.gov.

Sincerely,



Alecia M. VanAtta
Assistant Regional Administrator
Protected Resources Division

May 7, 2009

Alecia M. VanAtta
Assistant Regional Administrator
Protected Resources Division
National Marine Fisheries Service
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-4733

SUBJECT: Comments on DEIS North Kohala Ahi Aquaculture Project

Dear Ms. VanAtta,

Thank you for your letter of March 5, 2009 providing comments on the DEIS for the proposed ahi aquaculture project off North Kohala. In regards to your comments, this letter summarizes your comments in boldface, and provides the response to the comment following each:

- 1. "We ask that you provide a full acoustic impact analysis of the engine's operations as well as the installation and operations of the aquaculture project on marine mammals."**

Marine animals use sound to obtain detailed information about their surroundings. They rely on sound to communicate, navigate, and feed. Marine mammals, such as dolphins, use sound to locate and identify objects such as food, obstacles, and other marine mammals such as whales. By emitting clicks, or short pulses of sound, and listening to the echo, dolphins can detect individual prey and navigate around objects underwater. All sound values are water-standard values unless otherwise specified. All references are broadband-level values given in dBs, standardized at 1 microPascal at 1 m (dB re 1 microPa at 1 m) for source levels (SL) and dB re 1 microPa rms (root mean squared) for received levels (RL).

The sounds produced by marine life are many and varied. Marine mammals, such as humpback whales and bottlenose dolphins, produce sounds over a wide frequency range, from less than 10 Hz to greater than 200,000 Hz, depending on the species of marine mammal. Marine mammal calls can actually increase ambient noise levels by 20-25 underwater dB in some locations at certain times of year. Blue and fin whales produce low-frequency moans at frequencies of 10-25 Hz with estimated source levels of up to 190 underwater dB at 1 m. The ambient noise levels at frequencies of 17-20 Hz increase off coastal California during the fall and winter months due to blue and fin whale calls.

The ocean is filled with sound. Underwater sound is generated by a variety of natural sources, such as breaking waves, rain, and marine life. It is also generated by a variety of man-made sources, such as ships and military sonar. Some sounds are present more or less everywhere in the ocean all of the time. The background sound in the ocean is called ambient noise. The primary sources of ambient noise can be categorized by the frequency of the sound. Below is the sound spectra of typical sound sources found in the world oceans (Wenz, 62) and source levels.

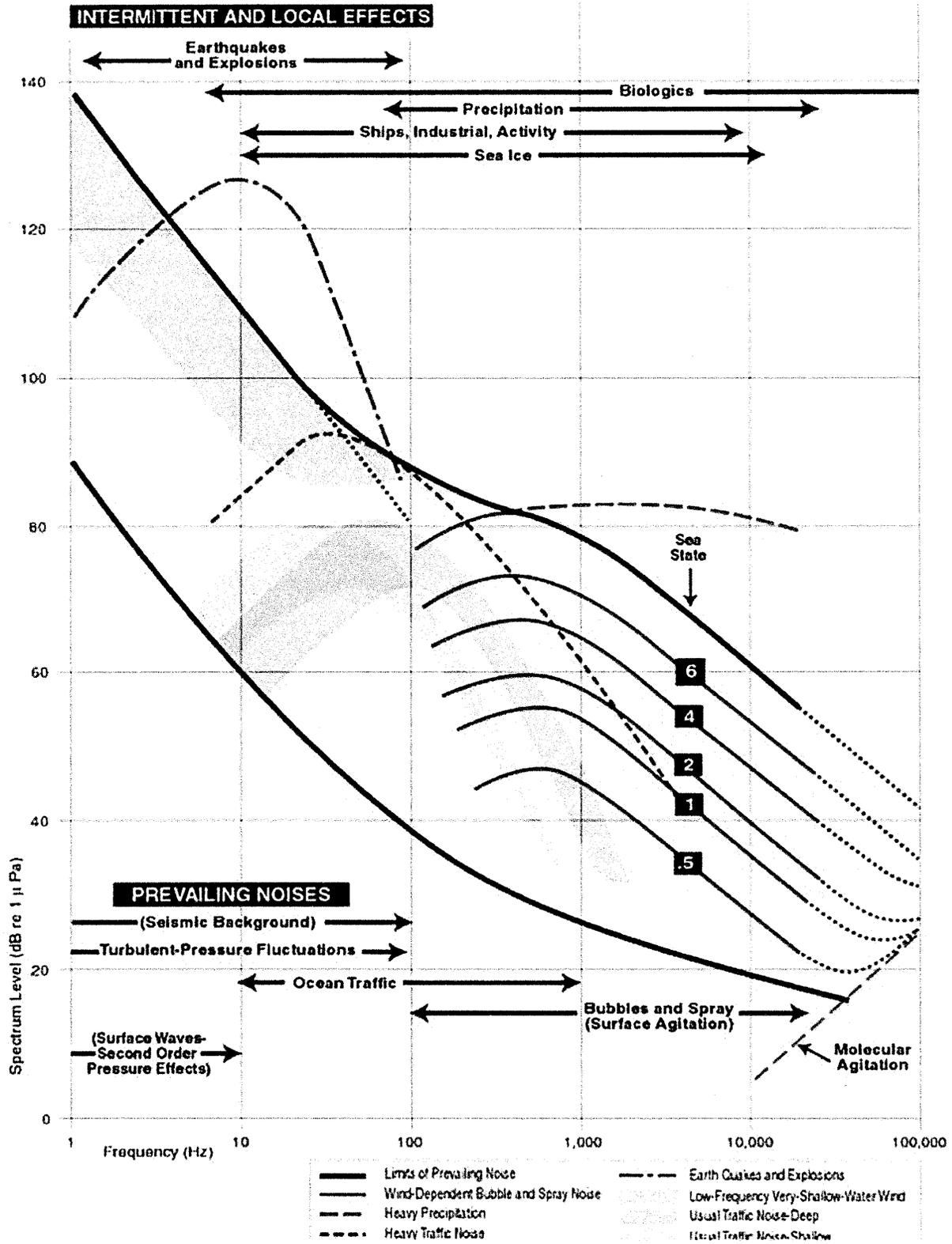


Figure 1 From Wenz, 1962, Wenz curves for sound sources in the world ocean, SL are in units of dB re: $\mu\text{Pa}^2/\text{Hz}$.

In the frequency range of 20-500 Hz, ambient noise is primarily due to noise generated by distant shipping. Even after removing any noise generated by ships close to the receiver, distant ships can be detected. The amount of noise is greater in regions with heavy shipping traffic. There tend to be fewer ships in the southern hemisphere, and low-frequency ambient noise levels are substantially lower as a result. Noise generated by shipping has increased as the number of ships on the high seas has increased (Andrew, et al., 2002).

Sounds generated by human activities are an important part of the total ocean acoustic background. Undersea sound is used for many valuable purposes, including communication, navigation, defense, research and exploration, and fishing. However, some sounds are just a by-product of another activity, such as the noise generated by ships and by offshore industrial activities, including oil drilling and production. Sounds generated by human activities cover a wide range of frequencies, from a few Hz up to several hundred kHz, and a wide range of source levels.

A significant noise impact would be one that would:

I. Result in underwater or in-air noise levels that are equal to or exceed NOAA Fisheries guidelines for Level A or B harassment of marine mammals (i.e. peak in-water levels generally at or above 160 dB re: 1 μ Pa rms, or in-air levels generally at or above 90 dBA) and/or in-water noise levels that exceed 190 dB re 1 μ Pa rms for sea turtles; or

II. Result in noise levels that would exceed an hourly average (Leq) of 50 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.) at residential property lines, or result in maximum instantaneous noise levels that exceed 70 dBA during the daytime and 65 dBA at night.

The source levels for some sounds generated by human and natural activities similar to the Oceansphere operations and estimates of the noise level created during Oceansphere operations itself are given in the following table. The Oceansphere will employ low rpm high torque thrusters which will produce low frequency noise at less than 90 dB at 1 m. This will drop off to The Maintenance and Installation operations of the Oceanspheres will use standard work boats with sound output levels of below 95 dB at 1 m in the frequency range of 20-500 Hz.

Sound Source	Broadband Source Level (dB re 1 microPa at 1 m)
Tug and Barge (18 km/hour)	171
Supply Ship (<i>Kigoriak</i>)	181
Large Tanker	186
Icebreaking	193
Medium Sized Ship	130 - 160
Blue Whale	190
Estimated Oceansphere (OS)	100
Estimated Work boat during OS Installation	110
Estimated Workboat during OS Maintenance/ Harvest	110
Estimate of Oceansphere Construction	110

Oceansphere operations will not exceed the 160 dB re 1 μ Pa at 1 m. The work boats are in the small to medium class range and will not be operated at full speed during installation operations. This is also true of maintenance and harvesting operations. The Oceanspheres are not high speed vehicles and as a result will employ low rpm high torque thrusters which will not produce excessive noise levels.

The Oceansphere will be constructed on the dock and towed out to the ocean lease site and deployed. Therefore it is anticipated that the construction of the Oceansphere will not result in any increase in ambient noise other over the sound of a normal tub boat.

2. **"There appears to be no entanglement issues that would result from the use of tethers to anchor the Oceanspheres in place, since they are free-floating structures; however"...the DEIS states that the pens will be marked by buoys and lights (p 2-29, par. 2), We ask that you provide information on how these marking devices will be anchored or tied into the pens themselves so that we may assess the likelihood of entanglement."**

The surface buoy will be connected to the Oceansphere by standard roping used in open mooring systems and approved by the USCG. A single mooring is necessary to connect the Oceansphere to the surface buoy as described in the DEIS. Radio communication must be conducted in the atmosphere so a surface expression is required. There will also be power and data cables to connect the buoy with the Oceansphere. The line between the buoy and the Oceansphere will be held taut due to the prevailing current, the buoyancy of the buoy and the propulsion system in the Oceansphere. Because of this, the possibility of entanglement is extremely unlikely.

3. **RE: concern that marine mammals may get entangled in the netting of the pens by inadvertently hooking their teeth into netting...which can result in injury and drowning.**

We are planning to use hardened Dyneema® or Kikkonet rigid plastic net pen mesh, which represents no entanglement threat to marine mammals.

4. **"We are concerned that the sharks, bottlenose dolphins and monk seals, "...could result in increased predation on dolphins and seals by sharks"**

Our Best Management Practices goal is to avoid predator interactions. Sharks and other pelagic predators will be attracted to the activities associated with off shore cage culture. We will avoid contact with

these pelagic predators by denying them a food source by the use of impenetrable cages and netting materials, video monitoring of feedings, and a wildlife monitoring and reporting system to meet DAR/DLNR protocol.

Kona Blue has recorded only rare instances of tiger sharks around its existing farm; probably related to seasonal migrations. For the first eight months of operation, only one fleeting shark sighting occurred: a small tiger shark. There are generally brief influxes of tiger sharks (mano: *Galeocerdo cuvier*) to the area in the months of September and October of each year. Most of the animals at this time appeared individually, or in pairs, with a range of sizes from 8ft to 15ft in length, and appear to not take up residence on the farm site. This is further confirmed by data from the DAR shark transponder receiver station on the farm site: tiger sharks only very infrequently pass by the site, and rarely do they show any interest in the operation. From July, 2006 to May, 2007, there were a total of eight (8) records of tagged tiger sharks in the Kona Blue farm area. None of these sharks took up residence. One animal passed by the farm site three times in two months, another animal was recorded twice in two months, and three other animals had single records.

Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh.

5 "KBWF as FAD, more fish outside pens attracts bottlenose dolphins..."We are concerned that this has resulted in a form of provisioning that has significantly changed the dolphins' feeding behavior."

According to the KBWF Final Supplemental EA (p. 34), the bottlenose dolphins present at their net pens are probably attracted to the farm site by a combination of three factors: (1) the presence of midwater structures acting as FADs, (ii) the occasional provisioning from "leakage" escapes when the net pens are opened for divers to enter or exit the net pen, and (iii) interactions with divers outside the net pen. While the Oceansphere will likely act as a midwater FAD, the design of the Oceansphere addresses the two other factors that attract dolphins. The Oceansphere avoids escapes by bringing the Oceansphere to the surface for harvest and maintenance operations which will avoid subsurface escape passages, and allow divers to enter or exit directly into the Oceansphere, thereby reducing any time spent by divers outside the Oceansphere. Use of the hardened Dyneema® or Kikkonet

rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh.

This will deny to dolphins a food source and they will lose interest.

6. "Please include an analysis of the effects of this project on these additional cetacean species (spotted dolphins, short-finned pilot whales, pygmy whales and false killer whales)"

The DEIS does include a description of these additional cetacean species on p. 2-51. The Oceansphere avoids escapes by bring the Oceansphere to the surface for maintenance operations and divers will enter from the surface, thus avoiding subsurface escape. This will deny to the additional cetacean species, including spotted dolphins, short-finned pilot whales, pygmy whales and false killer whales a food source and they will lose interest. The Oceansphere design minimizes any entanglement risk to these additional cetacean species.

Oceanic predators seek out dead and dying prey. To maintain a healthy population of tuna, mortalities will be removed on a timely basis, at least daily, by an onboard remotely operated vehicle, specialized for mortality retrieval and is already commercially available through Seabotix located at 2877 Historic Decatur Road, Suite 100, San Diego, California 92106.

7. Data from the KBWF marine mammal monitoring program can be used to infer similar impacts would occur at the proposed aquaculture site.

The KBWF FSEA states on p. 28 that

Over the last two years, the existing farm operation has demonstrated a propensity to attract Bottle-nose Dolphins (Tursiops truncatus). No bottle-nose dolphins were previously present on the farm site, but the animals have begun to appear regularly at the site since about October, 2006. Current patterns of dolphin movement can be best characterized as one or two animals, every day or so, with occasional instances of groups of up to seven or eight animals. There is no regularity to the animals' appearance on the farm site: they may be present all day, or only in the morning, or only in the afternoon. The animals appear to be preying on 'opelu and other wild fish around the net pens, and will quickly attack any escapee that may 'leak' out of a zipper as divers enter or leave a net pen. Dolphins will also attempt to interact with divers as they move from boats to net pens. However, no one individual animal has taken up residence and the overall long-term impacts on the animals is difficult to discern at this stage. These proposed amendments to the operating plan also should help alleviate the attractive nature of the farm to the dolphins, by reducing the potential for catastrophic escapes, and for leakage escapes, and – surface net pens are

deployed – by significantly reducing the amount of time that divers need to operate outside of the net pens.” (KBWF, FSEA, 2009, p. 28).

Hawaii Oceanic Technology has learned from this experience of KBWF and specifically designed the technology to solve the two main operational factors that attract dolphins, as described in the response to issue #5, above.

8. "The potential for this project to result in alteration of certain marine mammals' feeding behavior is, in our opinion, very high and could rise to the level of a take as defined under MMPA" "...a monitoring program is relied upon to identify and minimize adverse effects to marine mammals, "...but there is no explanation of how the operations could be modified to reduce or eliminate those impacts which have already been identified to occur at the KBWF aquaculture site"

As described above, the design of the Oceansphere is specifically to incorporate lessons learned from the KBWF experience with dolphins and the issue of provisioning these animals. By preventing escapes and reducing diver time outside the Oceansphere, the attractant nature of the Oceanspheres to dolphins will be substantially less.

Hawaii Oceanic Technology will work closely with the National Marine Fisheries Service Pacific Islands Regional Office, as well as the Hawaii DLNR Division of Aquatic Resources to update best management practices and monitoring and feeding protocols. Problems which arise will be evaluated and the regulatory agency responsible will be informed and consulted on the best way to change protocol to accommodate the effected species. The Oceansphere will be raised during maintenance operations and divers will enter from the surface, thus avoiding subsurface escape, which is identified to occur at the KBWF aquaculture site.

We appreciate your comments on the DEIS and have incorporated the results of the KBWF marine mammal monitoring program, and their experience with dolphins and sharks into the FEIS as described above. We will follow up with your staff to discuss these matters further and refine our monitoring protocol prior to initiating operations on site.

Sincerely,



William A. Spencer

CEO

Hawaii Oceanic Technology, Inc.

425 South St., Suite 2902

Honolulu, HI 96813

References

- Andrew, R.K., Howe, B.M., Mercer, J.A., and Dzieciuch, M.A. 2002. Ocean ambient sound: Comparing the 1960s with the 1990s for a receiver off the California coast. *Acoustics Research Letters Online*, 3(2):65-70.
- National Research Council. 2003. *Ocean Noise and Marine Mammals*. National Academy Press, Washington, D.C. 192 pp.
- Wenz, G. M. 1962. Acoustic ambient noise in the ocean: Spectra and sources. *Journal of the Acoustical Society of America*, 34, 1936-1956.



UNIVERSITY
of HAWAII
MĀNOA

Water Resources Research Center
Environmental Center

April 9, 2009

RE: 0790

Bill Spencer
Chief Executive Officer
Hawaii Oceanic Technology
425 South Street, Suite 2902
Honolulu, HI 96813

Dear Mr. Spencer:

Draft Environmental Impact Statement
Ahi Aquaculture Project
North Kohala, Hawaii

Hawaii Oceanic Technology, Inc. proposes to produce yellowfin and bigeye tuna in self-powered un-tethered submerged cages (oceanspheres). Fingerlings would be grown in land-based tanks and then grown to market size in these oceanspheres. The Proposed Action involves deploying twelve oceanspheres incrementally over four years, culminating in an annual production capacity of 6,000 tons. The proposed ocean lease site is a one square kilometer site located 2.6 nautical miles off the shore of Malae Point, North Kohala. The land base for vessels, operations and maintenance equipment, and staff will be Kawaihae Commercial Harbor. Tuna will be harvested for transshipping through Kawaihae or Hilo Harbor to existing processing and packaging vendors for air-freight to the US mainland, Japan, and Hawaii markets.

This review was conducted with the assistance of Clyde Tamaru, Aquaculture Specialist, Department of Molecular Bioscience and Bioengineering; and Ryan Riddle, Environmental Center.

General Comments

There is little information in the draft environmental impact statement (DEIS) about the economics of the operation. While there is some data about the cost to develop facilities, there is nothing on the amount of revenue that will be generated from the sale of the cultured tuna. It may be difficult to know the market prices of tuna since it varies with the type of fish raised, its physical condition at the time of sale and worldwide demand. The proposers, Hawaii Oceanic Technology however, must have some idea about the range of revenue they will receive for their product. This goes to the feasibility of the project and would be an important piece of information for decision makers to know before permitting the project.

In addition to our general comments we also have several specific comments.

Significant Beneficial and Adverse Effects (p. i)

This section lists only beneficial effects. Either the project doesn't have any adverse effects and the section should be retitled or some of the project's adverse impacts should be listed here. Table 2.1-1 on page 2-4 lists a number of adverse impacts of the project. Though none of these impacts are considered significant, they still may be considered adverse. Certainly there will be an adverse impact on water quality in the vicinity of the pens even if it dissipates quickly.

Purpose and Need (p. 1-3)

In the first paragraph of section 1.2 the DEIS states, "It has been reported that populations of large predatory fish in Hawaiian waters and the global ocean, including tuna, have been reduced to 90% of pre-industrial levels." Is this figure correct? It seems as if this rate is an underestimate.

Is the sustainable yield for yellowfin and bigeye tuna known?

Description of the Proposed Action (pp. 1-4 – 1-18)

Capture of adult tuna for establishing broodstock is very challenging. Is the fallback position to capture juveniles that are easier to acclimate to adults in captivity? This raises the question about whether the capture of juveniles is to be used in the stocking of cages in the event that hatchery operations are not initially successful. The alternative is to capture wild juveniles to be used in the stocking of the cages. This was not proposed in the Draft EIS. Is this a fallback position to consider or is all of the work being planned based on the availability of hatchery produced tuna juveniles?

This venture is based upon hatchery technologies that will be supplying fry from captive yellowfin and bigeye broodstock. Work is to be done at the University of Hawaii facility in Hilo (PACRC). Although there have been recent successes in hatchery outputs for yellowfin tuna, the reports emphasize that they are for research and experimental purposes. Commercial output is still a long way away. Technological advances in hatchery outputs of even the bluefin tuna (e.g., Kinki University) while exciting still have to be transferred to the Hilo facility. Will that hold-up the project?

The innovative design of the spheres, if operational, provide a means for addressing several of the drawbacks currently encountered in the tethered moorings being employed by the two existing open ocean ventures. This project clearly is taking the open culture technology to the next level. At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent. The propulsion system to hold the cages in the leased area is

April 9, 2009
Page 3

new, innovative and ecofriendly. However, is it capable of holding the spheres in the kinds of current systems in the offshore area of the Big Island?

Feeding (pp. 1-15 - 1-16)

The better unit for disease diagnostics would be the Aquaculture Development Program Disease Management Program run through the state Department of Agriculture. Is the broodstock feed going to be pelleted diet or wet diet? It is probably not necessary to have pelleted diets used for grow out inspected for pathogens as that is currently not done. Has a particular diet been identified for use with the tuna culture being proposed? Skretting is the largest producer of salmon feed and is very transparent about their feed ingredients, processing, and etc. Identification of the feed source would probably help alleviate the fears that will be raised due to the volume being used.

The last sentence of the first paragraph seems out of place. The discussion in this section deals with fish feed while the last sentence discusses space requirements at Kawaihae harbor. How are these two connected?

The last paragraph of this section on page 1-16 contains a discussion about supplementing fish-based feed stocks with by-products of bio-diesel production from a local source. Is there a bio-diesel project utilizing algae in the area? What happens if the bio-fuels project ends, will the ahi aquaculture be able to continue?

Oceansphere Maintenance and Tuna Health Inspections (pp. 1-16 - 1-17)

The 1 percent mortality rate cited in the third line in this section seems low. Mortality rates for other types of aquaculture are higher. What is the basis for making this estimate?

There is no mention of a plan of action in the event of disease outbreak. There are very few options available, but is a plan in place?

Terminology (p. 2-2)

The document being prepared for meeting the requirements of Chapter 343 is a draft environmental impact statement or DEIS. An EA refers to a preliminary document prepared to help an agency make a determination whether an EIS is or is not required. The two documents are often confused. There is also a reference to an EA on page 2-4.

April 9, 2009
Page 4

Summary of Potential Impacts of Implementing the Ahi Aquaculture Project Proposed Action, Alternative 2, and the No Action Alternative (p. 2-4)

The no action alternative for Socioeconomic issues should have a negative impact or otherwise be denoted with a minus sign. If this project presumes a beneficial socioeconomic effect should it be permitted, then there should be a negative impact if the project is not developed. There should also be a negative impact on the no action alternative for biological resources. If this project is not permitted, more wild stock tuna will be caught to satisfy world demand thereby depleting wild stocks more quickly.

We have a similar comment to the table and analysis presented on pages 2-135 and 2-136.

Waste Management (pp. 2-11 - 2-12)

It would be helpful to present data on the amount of fish processed at the existing facilities and how much the proposed ahi farm would add to waste product.

In the first paragraph on page 2-12 the DEIS states, "Hawaii Oceanic Technology plans to work with these fish processing companies to encourage that these fish byproducts be captured and used in the local cattle feed and nutraceutical industries." What is the size of these operations in Hawaii? Does the demand exist?

Resource Overview (p. 2-33)

The first bulleted point distinguishing the proposed open-ocean aquafarm with the existing two open-ocean farms cites the operating distance and the submersion below the surface as two differences. However, one of the existing farms is located 2 miles from shore and in 37 meters of water, not much different than the proposed facility. The real difference is that the proposed facility is located in much deeper water than the other two existing facilities.

No Impacts (pp. 2-42 - 2-43)

In the last paragraph of this section on the water quality impacts of the proposed open-ocean aquaculture facility, the water quality impacts of the Cates International and the experimental Hawaii Open-ocean Aquaculture Research Program (HOARP) cited as evidence that the proposed facility will have only minor impacts on water quality. Both the Cates International and HOARP had far smaller numbers of fish producing waste. The numbers in the proposed facility are more than an order of magnitude higher.

April 9, 2009

Page 5

Spinner and bottlenose dolphins and other large odontocetes (pp. 2-62 – 2-65)

There is a statement at the end of the fourth full paragraph on page 2-64 that “the level of the proposed activity is not expected to have a significant impact on marine mammals.” Is this a conclusion drawn by the authors or is there some expert analysis to corroborate this statement?

In the paragraph that begins at the end of page 2-64 and continues on the top of page 2-65 there is a discussion of oil spill prevention. It would be useful to note the amount of fuel carried by the work vessels used in this project. Size does make a difference in regards to oil spills. Although any spill of oil into marine waters must be reported to the authorities, the larger the spill, the bigger the potential for damage. Distance from shore may be a factor but even gasoline and diesel fuel can float for a long time on water and wash up on the shore.

Proposed Action – Malae Point (p. 2-81)

In the discussion of impacts to marine traffic in Kawaihae Harbor it is mentioned that the harbor is operating at levels below capacity. The actual capacity of the harbor is not provided.

Air Quality (pp. 2-82 – 2-87)

In paragraph one on page 2-82 the DEIS refers to the smaller carbon footprint of aquaculture in comparison to conventional methods of fishing, stating “Aquaculture burns less fossil fuels and saves on the amount of carbon dioxide released to the atmosphere.” This should be included as a potential beneficial impact in Table 2.8-2.

Figure 2.8-1 is missing a time span over which to interpret the increasing energy costs of Hawaii longline tuna fishing vs. aquaculture.

Economy, Employment, and Income (pp. 2-93 – 2-94)

In paragraph two in section 2.9.2 the DEIS states, “Hawaii Oceanic Technology is planning to supply only 10 percent of the local market with the open-ocean raised yellowfin tuna . . . Hawaii Oceanic Technology’s target market is the US mainland and Japan, where the selling prices would be twice as profitable as the local market. Therefore, the Proposed Action could have no impacts on the local market.” It would seem that by increasing the amount of ahi available locally, the proposed project would indeed have a small impact upon the local market.

Hawaii State Plan (p. 3-2)

There is evidence that the diversified agriculture (including aquaculture) is offsetting the demise of the sugarcane and pineapple industry. Aquaculture is still the fastest

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April 9, 2009
Page 6

growing segment of diversified agriculture both in the state and worldwide. It offers an opportunity for continued growth at a time when we can really use it.

Thank you for the opportunity to review this Draft EIS.

Sincerely,



Peter Rappa
Environmental Review Coordinator

cc: OEQC
Laura Thielen, DLNR OCCL
George Redpath, Tetrattech
James Moncur, WRRC
Clyde Tamaru
Ryan Riddle

May 20, 2009

Peter Rappa
Environmental Review Coordinator
Water Resources Research Center
Environmental Center
2500 Dole St., Krauss Annex 19
University of Hawaii, Manoa
Honolulu, HI 96822

Dear Mr. Rappa,

Thank you for the letter sent by you, Clyde Tamura and Ryan Riddle that thoroughly reviews the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project Draft Environmental Impact Statement. I will respond to your specific comments which I will reiterate here in bold face.

1. General comment regarding “economics of the operation” as it relates to the amount of revenue that will be generated from the sale of cultured tuna.

The DEIS requires an analysis of twelve specific affected environmental and environmental consequences. Section 2.9 requires a discussion of “Socioeconomic Conditions” affected. Our discussion can be found on page 2-88 through 2-94. The DEIS does not request specific business plan discussion regarding revenue that will be generated from the project from the sale of cultured tuna. We agree of course that this is an important part of the company’s business plan and model and indeed have “some idea about the range of revenue” we will receive for our product. We would not even propose such a project unless our business case was able to demonstrate economic feasibility and sustainability. Much of this discussion is contained in our Business Plan which has served as the basis for raising the private equity investment required to launch our operation in 2006 and continue to operate the business until it achieves positive cash flow. As you might imagine, much of this information is proprietary and since it is not requested by the DEIS specifically, it has not been included in the discussion.

That being said, I am happy to tell you that our financial projections take into a consideration a variety of factors that have demonstrated to the founders and the company’s investors that the operation of the business as outlined in the DEIS can be profitable. Some of the advantages the company expects to have are the ability to harvest its product on demand for designated distributors in key markets, provide a consistent quality of product at a negotiated price that provides acceptable Earnings before Income Tax, Depreciation and Amortization (EBITDA). We also expect to be able to deliver a quality product from Oceansphere to plate in less than 72 hours, grown in Hawaii’s pristine non-industrialized waters. Obviously some costs will be variable, such as feed, operations and to some extent market price, but we project that even

under the worst case scenario, each Oceansphere will generate a sufficient gross margin for this company to be a success.

- 2. Significant Beneficial and Adverse Effects (p.i) this section lists only beneficial effects. Either the project doesn't have any adverse effects and the section should be retitled or some of the project's adverse impacts should be listed here. Table 2.1-1 on page 2-4 lists a number of adverse impacts of the project. Though none of these impacts are considered significant, they still may be considered adverse. Certainly there will be an adverse impact on water quality in the vicinity of the pens even if it dissipates quickly.**

Table 2.1-1 and page 2-4 are prescribed by the DEIS format and are intended to be a summary of the conclusions discussed at length in the body of the DEIS where each of twelve impact areas are comprehensively reviewed. Pages 2-32 through 2-44 describe in comprehensive detail the water quality impacts, currents, Zone of Mixing model and other factors that have bearing on water quality and its impact in and around the vicinity of the Oceanspheres. The conclusions are documented in the appropriate section and all impacts are addressed as required. In summary, the Zone of Mixing model for water quality shows that outside the Zone of Mixing, the water quality will not be adversely affected by the proposed operation. Please see Table 2.4-2 for the results of the Zone of Mixing model and comparisons to the State of Hawaii water quality standard.

- 3. Purpose and Need (p. 1-3) in the first paragraph of section 1.2 the DEIS states, "It has been reported that populations of large predatory fish in Hawaiian waters and the global ocean, including tuna, have been reduced to 90% of pre-industrial levels." Is this figure correct? It seems as if the rate is an underestimate. Is the sustainable yield for Yellowfin and bigeye tuna known?**

We will clarify the wording you reference to read: "It has been reported that populations of large predatory fish in Hawaiian waters and the global ocean, including tuna, have been reduced by up to 90% ~~of~~ from pre-industrial levels..." Dr. Boris Worm in publications, lectures and interviews is one of many scientists that have predicted the imminent collapse of several fisheries. He stated in a recent interview published in April 2009, that "Our research established that the large proportion of these creatures... like tuna, billfish, shark – even large cod, halibut and species like that – have declined by up to 90% in many areas and that really showed me how profound our impact had been – not just in some areas, but really all of them." Hawaii fishermen have reported that Hawaiian waters are essentially fished out. Long liners must travel as much as 1,500 miles away from Hawaii and stay at sea for up to two to three weeks at a time to catch and bring enough tuna back to Hawaii for auction in order to make ends meet. In interviews with Brooks Takenaka, US Fishing Agency (the Honolulu fish auction) and Kerry Umamoto, of Kona Fish Company, it has been reported that catches of mature Yellowfin and big eye in particular are way down and on some days few if any are brought to market. Despite the anecdotal nature of some of the information we have

relied upon, it is still clear that population growth, demand for seafood protein and the impact of pelagic species at the high end of the troposphere are under severe stress and alternatives such as open ocean aquaculture need to be developed in order to reduce the stress on these fisheries.

- 4. Description of the Proposed Action (pp. 1-4 – 1-8) Capture of adult tuna for establishing broodstock is very challenging. Is the fallback position to capture juveniles that are easier to acclimate to adults in captivity? This raises the question about whether the capture of juveniles is to be used in the stocking of cages in the event that hatchery operations are not initially successful the alternative is to capture wild juveniles to be used in the stocking of the cages. This was not proposed in the Draft EIS. Is this a fallback position to consider or is all of the work being planned based on the availability of hatchery produced tuna juveniles?**

The Draft EIS specifically states that the intention of the project is to be based on a closed loop approach where juvenile tuna will be grown out from eggs spawned in a hatchery. It is not and never has been the “fallback” position of this project to stock Oceanspheres with juveniles. This practice, done in the Mediterranean, Mexico and Australia among other locations is destructive to the fishery. Our sub-contractor, the Pacific Aquaculture and Coastal Research Center has obtained the necessary permits to capture tuna for broodstock purposes. Whether they capture juveniles or mature ahi for this purpose is not part of the Draft EIS.

This venture is based upon hatchery technologies that will be supplying fry from captive Yellowfin and bigeye broodstock. Work is to be done at UH Hilo (PACRC). Although there have been recent successes in hatchery outputs for Yellowfin tuna, the reports emphasize that they are for research and experimental purposes. Commercial output is still a long way away. Technological advances in hatchery outputs of even the bluefin tuna (e.g.), Kinki University) while exciting still have to be transferred to the Hilo facility. Will that hold-up the project?

The protocol that PACRC intends to follow has been established at the Achotines Laboratory in Panama with Yellowfin tuna and has been replicated for more than 12 years. Staffs from Hawaii Oceanic Technology and PACRC have attended classes at Achotines which is part of the Inter-American Tropical Tuna Commission. The company is not dependent upon transfer of technological advances from Kinki or Clean Seas in South Australia but is not averse to collaborations with those entities as well as our own Oceanic Institute and others companies which have offered to collaborate. PACRC has all of the facilities and capacity necessary to undertake the steps necessary for commercial output of ahi fingerlings necessary for the success of this project. We obviously cannot anticipate a “hold-up of the project” until such “hold-ups” occur.

The innovative design of the spheres, if operational, provide a means for addressing several of the drawbacks currently encountered in the tethered

moorings being employed by the two existing open ocean ventures. This project clearly is taking the open culture technology to the next level. At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent. The propulsion system to hold the cages in the leased area is new innovative and ecofriendly. However, it is capable of holding the spheres in the kinds of current systems in the offshore area of the Big Island?

We agree that the approach the company is taking is innovative and solves many of the problems of alternative systems and look forward to taking open ocean aquaculture to the next level. We appreciate your acknowledgment that the propulsion system to hold the cages in geostatic position in the leased area is ecofriendly. We must point out however that much of the technology the company intends to employ has been thoroughly demonstrated, tested and is in fact in use by modern day open ocean oil drilling companies. Modern day oil rigs are unmanned and remotely operated and able to stay accurately in specific locations in a variety of currents and sea conditions. Our company is building on lessons learned from this industry and technologies that are commercially available. It should also be pointed out that the ocean lease site that has been proposed was carefully selected based on a variety of factors related to currents, protection from winds and relatively constant calm sea conditions.

- 5. Feeding (pp. 1-15 – 1-16) the better unit for disease diagnostics would be the Aquaculture Development Program Disease management Program run through the state Department of Agriculture. Is the broodstock feed going to be pelleted diet or wet diet/ It is probably not necessary to have pelleted diets used for grow out inspected for pathogens as that is currently not done. Has a particular diet been identified for use with the tuna culture being proposed Skretting is the largest producer of salmon feed and is very transparent about their feed ingredients, processing and etc. Identification of the feed source would probably help alleviate the fears that will be raised due to the volume being used. The last sentence of the first paragraph seems out of place. The discussion in this section deals with fish feed while the last sentence discusses space requirements at Kawaihae harbor. How are the two connected**

Thank you for suggestion the ADP Disease Management Program for disease diagnostics. We plan to work closely with a variety of sources. We have not identified the best diet at this time, but plan to be transparent in the specification of diet being used. We recognize Skretting to be a large producer and expect to prescribe to them feed ingredients and processing methods we would like employed. Furthermore, when possible, we would like to source certain food components locally so as to reduce shipping and storage costs. The reference to Kawaihae was included in this discussion as it pertains to where feed will come into the island and how much space it will require.

The last paragraph of this section on page 1-16 contains a discussion about supplementing fish-based stocks with by-products of bio-diesel production from a local source. Is there a bio-diesel project utilizing algae in the area? What happens if the bio-fuels project ends, will the ahi aquaculture be able to continue?

Our research indicates that there are several very large projects coming on line over the next few years which intend to use algae to produce biofuels including Cellana, Hawaii BioEnergy and others. We recognize that the algae protein byproduct is a possible source of protein that can be used to replace fish protein in fish meal. We also have it on good authority that some algae can be formulated so that the Omega 3 and 6 fatty acids can be retained by the algae protein. Obviously this is highly experimental, but if we can reduce pressures on low value fish used in fish protein and develop a locally produced source of food for our project, we would like to pursue it. If these projects go out of business, we do not anticipate this would have a negative impact on our business since commercial fish feed is available from companies that can formulate the feed to our company's specifications.

- 6. Oceansphere Maintenance and Tuna Health Inspections (pp. 1-16 – 1-17) the 1 percent mortality rate cited in the third line in this section seems low. Mortality rates for other types of aquaculture are higher. What is the basis for making this estimate? There is not mention of a plan of action in the event of disease outbreak. There are very few options available, but is a plan in place?**

As stated in the pages cited, a low stocking density (4 cubic meters per fish) afforded by the large capacity of the Oceansphere (82,000 cubic meters) is anticipated to reduce the incidence of mortality and disease transfer. Fish health will be monitored remotely via video and mortalities will be removed daily and sent to the Hawaii Institute of Marine Biology (HIMB) for necropsy. As stated if disease is found, the tuna will be treated as appropriate based on the advice of HIMB pathologists.

- 7. Terminology (p. 2-2) the document being prepared for meeting the requirements of Chapter 343 is a draft environmental impact statement or DEIS. An EA refers to a preliminary document prepared to help an agency make a determination whether an EIS is or is not required. The two documents are often confused. This is also a reference to an EA on page 2-4.**

Thank you for finding this typo. In fact a draft EA document was prepared and submitted to DLNR. Upon review of this document, DLNR determined that we should prepare an EIS. We will correct this typographical error in the Final EIS.

- 8. Summary of Potential Impacts of Implementing the Ahi Aquaculture Project Proposed Action, Alternative 2, and the No Action Alternative (p. 2-4) The no action alternative for Socioeconomic issues should have a negative impact or otherwise be denoted with a minus sign. If this project presumes a beneficial socioeconomic effect should it be permitted, then there should be a negative impact if the project is not developed. There should also be a negative impact on the no action alternative for biological resources. If this project is not permitted, more wild stock tuna will be caught to satisfy world demand thereby depleting wild stocks more quickly. We have a similar recommendation on the table and analysis presented on pages 2-135 and 2-136.**

We will not be able to change this in the EIS because we have a finding of “no significant impact” for doing the project or not doing the project. We think this is the best way to address this because we do not think the impact is negative.

- 9. Waste Management (pp. 2-11 – 2-12) it would be helpful to present data on the amount of fish processed at the existing facilities and how much the proposed ahi farm would add to the waste product. In the first paragraph on page 2-12 the DEIS states, “Hawaii Oceanic Technology plans to work with these fish processing companies to encourage that these fish byproducts be captured and used in the local cattle feed and nutraceuticals industries.” What is the size of these operations in Hawaii? Does the demand exist?”**

First it should be noted that existing processing facilities in Kona and Hilo have expressed a desire to work with us and indicated they have the capacity to provide processing services. Please note that the company will be phasing up to its full capacity of 6,000 tons of ahi per year over a several year period and we expect that the processing companies we work with will also increase capacity as demand increases. Presently the company only plans to gut and gill its fish as that is what the market demands. These by products have been requested by cattle ranchers throughout the Big Island. They have indicated they have the ability to take as much by product as we can supply. Use of the offal for production of Omega 3 and 6 for fish food supplement is desirable but not in place at the present time. This is what is being referred to as nutraceuticals.

- 10. Resource Overview (p.2-33) The first bulleted point distinguishing the proposed open-ocean Aquafarm with the existing two open-ocean farms cites the operating distance and the submersion below the surface as two differences. However, one of the existing farms is located 2 miles from shore and in 37 meters of water, not much different than the proposed facility. The real difference is that the proposed facility is located in much deeper water than the other two existing facilities.**

Thank you for pointing this out.

11. No Impacts (pp 2-42 – 2-43) In the last paragraph of this section on the water quality impacts of the proposed open-ocean aquaculture facility, the water quality impacts of the Cates international and the experimental Hawaii Open-ocean Aquaculture Research Program (HOARP) cited as evidence that the proposed facility will have only minor impacts on water quality. Both the Cates International and HOARP had far smaller numbers of fish producing waste. The numbers in the proposed facility are more than an order of magnitude higher.

The fact that the lease area is larger than either of the two cited facilities and the depth of the water, plus constant currents as well as the biological likelihood that effluents will never reach the bottom are factors in making this determination. This is also combined with the ZOM model which relies on the much greater volume of water in the area than the other two sites.

12. Spinner and bottlenose dolphins and other large odontocetes (pp. 2-62 – 2-65)... and comments on oil spill prevention.

The conclusion about the level of impact on marine mammals is drawn from the experience that Kona Blue Water Farm has had, as well as the design of the Oceansphere technology that incorporates improvements to reduce the attraction of the Oceansphere and its operations to dolphins. According to the KBWF Final Supplemental EA (p. 34), there is no evidence of any interaction whatsoever between spinner dolphins and the farm operation. The KBWF FSEA (p. 34) states that the bottlenose dolphins present at their net pens are probably attracted to the farm site by a combination of three factors: (1) the presence of midwater structures acting as FADs, (ii) the occasional provisioning from “leakage” escapes when the net pens are opened for divers to enter or exit the net pen, and (iii) interactions with divers outside the net pen. While the Oceansphere will likely act as a midwater FAD, the design of the Oceansphere addresses the two other factors that attract dolphins. The Oceansphere avoids escapes by bringing the Oceansphere to the surface for harvest and maintenance operations which will avoid subsurface escape passages, and allow divers to enter or exit directly into the Oceansphere, thereby reducing any time spent by divers outside the Oceansphere. Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh.

The operating vessels will be Coast Guard-approved standard 35-ft work boats with standard fuel tanks and capacity, and the harvest vessel will also be Coast Guard-approved with standard fuel tanks and capacity.

13. Proposed Action – Malae Point (p. 2-81) in the discussion of impacts to marine traffic in Kawaihae Harbor it is mentioned that the harbor is

operating at levels below capacity. The actual capacity of the harbor is not provided.

This conclusion was drawn from discussions with the Harbor Master and Hawaii District Administrator at the time. The Kawaihae Commercial Harbor 2035 master plan is now being developed and the company is participating in discussions on this effort. It is not complete as of this time and cannot be cited as a basis for more detail to answer your questions.

14. Air Quality (pp. 2-82-2-87) In paragraph one on page 2-92 the DEIS refers to the smaller carbon footprint of aquaculture in comparison to conventional methods of fishing, stating “Aquaculture burns less fossil fuels and saves on the amount of carbon dioxide release to the atmosphere.” This should be included as a potential beneficial impact in Table 2.8-2. Figure 2.8-1 is missing a time span over which to interpret the increasing energy costs of Hawaii long line tuna fishing vs. aquaculture.

Thank you for pointing this out.

15. Economy, Employment, and Income (pp. 2-93 – 2-94) In paragraph two in sections 2.9.2 the DEIS states, “Hawaii Oceanic Technology is planning to supply only 10 percent of the local market with the open-ocean raised Yellowfin tuna...Hawaii Oceanic Technology’s target market is the US mainland and Japan, where the selling prices would be twice as profitable as the local market. Therefore the Proposed Action should have no impacts on the local market.” It would seem that by increasing the amount of ahi available locally, the proposed project would indeed have a small impact upon the local market.

The company will only introduce supplies of its brand of ahi into the local market as appropriate to assist with branding its product. If more ahi is desired and if it does not affect the livelihood of local fishermen, more can be supplied, but it is not the intent of the company to compete with local fishermen on supply or price of ahi.

16. Hawaii State Plan (p.3-2) There is evidence that the diversified agriculture (including aquaculture) is offsetting the demise of the sugarcane and pineapple industry. Aquaculture is still the fastest growing segment of diversified agriculture both in the state and worldwide. It offers an opportunity for continued growth at a time when we can really use it.

Thank you for pointing out this important fact.

We appreciate your comprehensive review of the DEIS.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long, sweeping flourish extending to the right.

William A. Spencer
CEO

Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813



RECEIVED
DISTRICT OF CONSERVATION
AND COASTAL LANDS

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STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

HRD09/4068B

March 3, 2009

Sam Lemmo
Office of Conservation and Coastal Lands
PO Box 621
Honolulu, Hawai'i 96809

RE: Request for comments on the conservation district use application (CDUA) for Hawaii Oceanic Technology, Inc. aquaculture project, offshore waters, Malae Point.

Aloha e,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated . OHA has reviewed the project and offers the following comments.

OHA understands that the only part of this project that will protrude above the water is the telemetry buoy with associated antennae and warning lights. (CDUA, pages 13 and 32) We also note that the applicant is asking that the public remain 100 feet away from them. (CDUA, page 13) Otherwise, the public's use of this area will not be negatively affected.

We also see the potential in this proposal. We agree that our local stocks of fish have been heavily impacted and that new approaches such as this towards ocean resources must be advanced. OHA offers our initial support for this project in theory and looks forward to further careful presentation and analysis of it.

Recognizing that this is a CDUA application, we do ask that the state consider the potential effect upon the wildlife and aquatic life of the surrounding area, in particular to protected species. The applicant mentions several times that "the proposed action proposes to include a monitoring and management plan concerning any interactions with marine mammals, sea turtles, and sharks, which will be developed in consultation with the regulatory agencies from the State and federal government." (CDUA, page 16 and also DEIS, page i)

OHA points out that these studies should be presented in both the CDUA and the environmental review. Otherwise, potential adverse effects and their associated mitigations cannot be assessed. It is not enough to say that the applicant will create such monitoring and management plans in the future. The applicant even states that, "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." (CDUA, page 16) We ask that these potential impacts and plans both be elaborated upon so that OHA and the state can better perform our constitutional and legislative duties.

These plans have additional relevance for OHA because, as the applicant points out, "To some native Hawaiians, the shark is a sacred animal, and is considered a member of their ohana. When developing the shark management plan for the aquaculture farm, it would be important (to) make sure that measures to keep the sharks away from working divers must be culturally appropriate." (CDUA, page 29)

We also see that the product harvested from this proposal is designed to reach a global market, including the U.S. mainland. We do ask if the applicant that the applicant consider setting a percentage of their harvest to sell to local markets and also about the possibility of replenishing local stocks of tuna with mature, breeding fish. This will help to ensure that this proposal is in the public interest.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold by phone at (808) 594-0263 or e-mail him at granta@oha.org.

'O wau iho nō me ka 'oia'i'o,



Clyde W. Nāmu'o
Administrator

C: OHA Kona CRC

May 18, 2009

Clyde W. Namu'o
Administrator
Office of Hawaiian Affairs
711 Kapiolani Blvd, Suite 500
Honolulu, HI 96813

Dear Mr. Namuo,

Thanks for your comments on the Draft Environmental Impact Statement for the proposed ahi aquaculture project off the Kohala coast on the island of Hawaii. In response to your comments, we have summarized your comment or question in bold, then responded below your question.

"The only part of the project that will protrude above water is the buoy... the public is to remain 100' away, otherwise public use will not be negatively affected"

We appreciate that your analysis and conclusion regarding access by the public. This is an important issue for the community and the company. As stated in the FEIS, we request that the public stay 100 feet away for operational and safety reasons. We will allow fisherman to fish within the lease area so long as they adhere to the 100' safety zone.

"We also see the potential in this proposal...we agree that local stocks of fish have been heavily impacted and new approaches such as this must be advanced. OHA offers our initial support for this project in theory and looks forward to further careful presentation and analysis of it."

We have prepared a full Environmental Impact Statement and we will pursue a policy of full disclosure to the public with this project moving forward.

"...ask state to consider the potential effect upon the wildlife and aquatic life of the surrounding area, in particular to protected species...." "The monitoring and management plans for marine mammals, sea turtles and sharks should be in CDUA and EIS"

The EIS and CDUA include the initial monitoring and management plans for marine mammals, sea turtles and sharks. A comprehensive management plan that adheres to guidelines established by Division of Aquatic Resources and relevant federal agencies will be implemented once the permit has been granted and the project becomes operational.

"We ask that these potential impacts (on protected species) and (monitoring and mgt.) plans both be elaborated upon. These plans have particular relevance because of spiritual significance of sharks."

The FEIS section on impacts on protected species and monitoring and management plans have both been expanded as per your suggestion. We realize the spiritual significance of sharks to the Hawaiian people and we will ensure the safety of sharks as part of our best management practices.

"We do ask ...that the applicant consider setting a percentage of their harvest to sell to local markets.....also about the possibility of replenishing local stocks of tuna with mature, breeding fish. This will help ensure that this proposal is in the public interest."

The FEIS indicates that we will provide 10% of our annual harvest to the Hawaii market which is one fifth to the annual consumption rate of high quality tuna in Hawaii. We are sensitive to not having a negative impact on the local fishing industry, but recognize nonetheless that Hawaii imports 80% of the seafood we consume. We cannot release aquaculture fish to the wild as described in NOAA and DLNR guidelines. Should these guidelines change in the future we will work closely with DLNR/DAR to replenish local stocks of yellowfin and bigeye tuna.

Thank you for your comprehensive comments on the DEIS. Our company looks forward to the opportunity to meet with you and the OHA trustees to provide updates on the company's progress.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer
CEO

Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

LINDA LINGLE
GOVERNOR



RUSS K. SAITO
COMPTROLLER

BARBARA A. ANNIS
DEPUTY COMPTROLLER

(P)1070.9

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

MAR - 2 2009

MEMORANDUM

TO: Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources

FROM: Russ K. Saito
State Comptroller 

SUBJECT: Proposed Conservation District Use Application (CDUA) and Request for Lease for Marine Waters for the Hawaii Oceanic Technology, Inc. Aquaculture Project, Offshore Waters of Malae Point, North Kohala, Island of Hawaii

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MAINTENANCE
STATE OF HAWAII
OFFICE OF CONSERVATION AND COASTAL LANDS

Thank you for the opportunity to provide comments for the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400, or have your staff call Mr. David DePonte of the Public Works division at 586-0492.

LINDA LINGLE
GOVERNOR

MAJOR GENERAL ROBERT G. F. LEE
DIRECTOR OF CIVIL DEFENSE

EDWARD T. TEIXEIRA
VICE DIRECTOR OF CIVIL DEFENSE



PHONE (808) 733-4300
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STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

March 2, 2009

Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii 96809

RECEIVED
NATURAL RESOURCES
STATE OF HAWAII

2009 MAR -4 A 8:10

OFFICE OF THE DIRECTOR
OF CONSERVATION
AND COASTAL LANDS

Dear Mr. Lemmo:

Draft Environmental Impact Statement
Ahi Aquaculture Project, Kohala Coast, Hawaii

Thank you for the opportunity to comment on this project. After careful review of the Notice of Acceptance, Transmittal Letter and Response from Hawaii Oceanic Technology, Inc., Conservation District Use Application, and the Draft Environmental Impact Statement that have been provided, we feel that potential natural hazards have been acknowledged and that appropriate mitigation measures have been considered in preparing for any future incident.

We look forward to reviewing the final Environmental Impact Statement. If you have any questions, please call Mr. Larry Kanda, State Hazard Mitigation Officer, at (808) 733-4300.

Sincerely,


EDWARD T. TEIXEIRA
Vice Director of Civil Defense

William P. Kenoi
Mayor



Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

County of Hawai'i

FIRE DEPARTMENT 2009 FEB 25 P 3: 58
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

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DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

February 21, 2009

Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P. O. Box 621
Honolulu, HI 96809

Dear Mr. Lemmo,

RE: PROPOSED CONSERVATION DISTRICT USE APPLICATION (CDUA) AND
REQUEST FOR LEASE FOR MARINE WATERS FOR THE HAWAII OCEANIC
TECHNOLOGY, INC. AQUACULTURE PROJECT, OFFSHORE WATERS OF
MALAE POINT, NORTH KOHALA, ISLAND OF HAWAII

This responds to your request for comments regarding the above referenced project.

We have no comments to offer at this time concerning this proposal.

Thank you for the opportunity to participate in the planning stages of the project.

Sincerely,

Handwritten signature of Darryl Oliveira in black ink.

DARRYL OLIVEIRA
Fire Chief

GN:lk



William P. Kenoi
Mayor



Harry S. Kubojiri
Police Chief

RECEIVED
COUNTY OF HAWAII
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 FEB 26 A 10: 25

Paul K. Ferreira
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2389

OFFICE OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

February 23, 2009

Mr. Samuel J. Lemmo, Administrator
State of Hawai'i
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Lemmo:

SUBJECT: Proposed Conservation District Use Application (CDUA) and Request for Lease for Marine Waters for the Hawai'i Oceanic Technology, Inc. Aquaculture Project, Offshore Waters of Malae Point, North Kohala, Island of Hawai'i

Staff has reviewed the proposed CDUA and Request for Lease and has no comments or objections to offer at this time.

Should you have any questions, please contact Captain Richard Miyamoto, Commander of the North Kohala District, at 889-6540.

Sincerely,

HARRY S. KUBOJIRI
POLICE CHIEF


HENRY J. TAVARES JR.
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

RM:dmv

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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2009 FEB 25 A
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:DH

CDUA HA-3496

Acceptance Date: January 30, 2009
180-Day Exp. Date: July 29, 2009
FEB 10 2009

MEMORANDUM

TO: Division of Aquatic Resources, Division of Forestry and Wildlife, Division of Conservation and Resource Enforcement, Historic Preservation Division, Division of Boating and Ocean Recreation, Hawaii District Land Agent, Engineering Division, Division of State Parks

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application HA-3496
Proposed Hawaii Oceanic Technology, Inc. Aquaculture Project

APPLICANT: Hawaii Oceanic Technology, Inc.

REQUEST: CDUA Permit and Lease State Marine Waters for Aquaculture Facility

LOCATION: Offshore Malae Point, North Kona, Island of Hawaii

PUBLIC HEARING: YES X NO

Attached please find a copy of the subject CDUA, and our Department's Notice of Acceptance. We would appreciate your review and comment on this CDUA by the suspense date by **March 6, 2009**. We are including a copy of the Draft Environmental Impact Statement. Should you require additional information please call Dawn Hegger at the OCCL 587-0380. If no response is received by the suspense date, we will assume there are no comments.

- () Comments Attached
- () No Comments

Signature
2/23/09

Date

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

OCCL/DawnHegger
Ref.:CDUAHA3496HawaiiOceanTechnology
Hawaii.423

COMMENTS

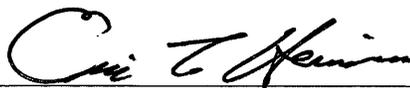
- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- () Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- (X) **Please note that the National Flood Insurance Program does not regulate activities under water.**
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
 - () Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
 - () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
 - () Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
-
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
 - () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
 - () Additional Comments: _____

 - () Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: 
ERIC T. HIRANO, CHIEF ENGINEER

Date: 2/23/09

LINDA LINGLE
GOVERNOR
STATE OF HAWAII



MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

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AND COASTAL LANDS
KAULANA H. PARK
DEPUTY CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS 2009 FEB 23 A 8:41

P.O. BOX 1879
HONOLULU, HAWAII 96805

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AND COASTAL LANDS
STATE OF HAWAII

February 20, 2009

Mr. Samuel J. Lemmo, Administrator
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Post Office Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

Subject: Proposed Conservation District Use Application (CDUA)
and Request for Lease for Marine Waters for the Hawaii
Oceanic Technology, Inc. Aquaculture Project, Offshore
Waters of Malae Point, North Kohala, Island of Hawaii

Thank you for the opportunity to review the subject proposal.
The Department of Hawaiian Home Lands has no comment to offer at
this time. If you have any questions, please contact our
Planning Office at (808) 620-9480.

Aloha and mahalo,

for 
Micah A. Kane, Chairman
Hawaiian Homes Commission

LINDA LINGLE
GOVERNOR OF HAWAII



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STATE HISTORIC PRESERVATION
DIVISION
2009 FEB 18 A 7:58

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

February 17, 2009

LOG NO: 2009.0712
DOC NO: 0902MD26

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

FROM: Nancy McMahon, Deputy SHPO/State Archaeologist and Historic Preservation Manager
State Historic Preservation Division *Nancy A. McMahon*

SUBJECT: **Chapter 6E-42 Historic Preservation Review –
Request for Comment – Conservation District Use Application HA-3496
No Ahupua`a, No District, Island of Hawaii
Three Miles Offshore from Malae Point in North Kona**

Thank you for the opportunity to comment on the aforementioned project, which we received on February 12, 2009. The applicants plan on developing a tuna fish aquaculture project. We determine that **no historic properties will be affected** by this project because:

- Intensive cultivation has altered the land
- Residential development/urbanization has altered the land
- Previous grubbing/grading has altered the land
- An accepted archaeological inventory survey (AIS) found no historic properties
- SHPD previously reviewed this project and mitigation has been completed
- Other: *We have no record of historic properties in this location.*

In the event that historic resources, including human skeletal remains, cultural materials, lava tubes, and lava blisters/bubbles are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, Hawaii Island Section, needs to be contacted immediately at (808) 933-7653.

If you have questions about this letter please contact Morgan Davis at (808) 933-7650.

52896

LINDA LINGLE
GOVERNOR OF HAWAII



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2009 FEB 18 A 9:36

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:DH

CDUA HA-3496

DEPT OF LAND &
NATURAL RESOURCES

Acceptance Date: January 30, 2009
180-Day Exp. Date: July 29, 2009
FEB 10 2009

MEMORANDUM

TO: Division of Aquatic Resources, Division of Forestry and Wildlife,
Division of Conservation and Resource Enforcement, Historic
Preservation Division, Division of Boating and Ocean Recreation, Hawaii
District Land Agent, Engineering Division, Division of State Parks

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application HA-3496
Proposed Hawaii Oceanic Technology, Inc. Aquaculture Project

APPLICANT: Hawaii Oceanic Technology, Inc.

REQUEST: CDUA Permit and Lease State Marine Waters for
Aquaculture Facility

LOCATION: Offshore Malae Point, North Kona, Island of Hawaii

PUBLIC HEARING: YES X NO

Attached please find a copy of the subject CDUA, and our Department's Notice of Acceptance. We would appreciate your review and comment on this CDUA by the suspense date by **March 6, 2009**. We are including a copy of the Draft Environmental Impact Statement. Should you require additional information please call Dawn Hegger at the OCCL 587-0380. If no response is received by the suspense date, we will assume there are no comments.

() Comments Attached
(✓) No Comments

Signature
2/17/09

Date

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
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HONOLULU, HAWAII 96809

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2009 FEB 12 A 10:52

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
RUSSELL Y. TSUJI
FIRST DEPUTY
KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:DH

CDUA HA-3496

Acceptance Date: January 30, 2009
180-Day Exp. Date: July 29, 2009
FEB 10 2009

MEMORANDUM

TO: Division of Aquatic Resources, Division of Forestry and Wildlife,
Division of Conservation and Resource Enforcement, Historic
Preservation Division, Division of Boating and Ocean Recreation, Hawaii
District Land Agent, Engineering Division, Division of State Parks

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application HA-3496
Proposed Hawaii Oceanic Technology, Inc. Aquaculture Project

APPLICANT: Hawaii Oceanic Technology, Inc.

REQUEST: CDUA Permit and Lease State Marine Waters for
Aquaculture Facility

LOCATION: Offshore Malae Point, North Kona, Island of Hawaii

PUBLIC HEARING: YES X NO

Attached please find a copy of the subject CDUA, and our Department's Notice of Acceptance. We would appreciate your review and comment on this CDUA by the suspense date by **March 6, 2009**. We are including a copy of the Draft Environmental Impact Statement. Should you require additional information please call Dawn Hegger at the OCCL 587-0380. If no response is received by the suspense date, we will assume there are no comments.

() Comments Attached

X No Comments
More suited for DAR review.

Signature **PAUL J. CONRY, ADMINISTRATOR**
Date **DIVISION OF FORESTRY AND WILDLIFE**
FEB 11 2009

LINDA LINGLE
GOVERNOR OF HAWAII



2009 FEB 12 10:51 AM

RECEIVED STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
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POST OFFICE BOX 62111
HONOLULU, HAWAII 96809

OFFICE: 5-9-03
LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
RUSSELL Y. TSUIJI
FIRST DEPUTY
KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:DH

CDUA HA-3496

Acceptance Date: January 30, 2009
180-Day Exp. Date: July 29, 2009
FEB 10 2009

MEMORANDUM

TO: Division of Aquatic Resources, Division of Forestry and Wildlife,
Division of Conservation and Resource Enforcement, Historic
Preservation Division, Division of Boating and Ocean Recreation, Hawaii
District Land Agent, Engineering Division, Division of State Parks

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application HA-3496
Proposed Hawaii Oceanic Technology, Inc. Aquaculture Project

APPLICANT: Hawaii Oceanic Technology, Inc.

REQUEST: CDUA Permit and Lease State Marine Waters
Aquaculture Facility

LOCATION: Offshore Malae Point, North Kona, Island of Hawaii

PUBLIC HEARING: YES X NO

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2009 FEB 21 A 8:10
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Attached please find a copy of the subject CDUA, and our Department's Notice of Acceptance. We would appreciate your review and comment on this CDUA by the suspense date by **March 6, 2009**. We are including a copy of the Draft Environmental Impact Statement. Should you require additional information please call Dawn Hegger at the OCCL 587-0380. If no response is received by the suspense date, we will assume there are no comments.

() Comments Attached

(X) No Comments

Signature
2/24/09
Date

LINDA LINGLE
GOVERNOR OF HAWAII

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HILO, HAWAII

2009 FEB 18 P 3:06



LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUII
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
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STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:DH

CDUA HA-3496

Acceptance Date: January 30, 2009

180-Day Exp. Date: July 29, 2009

FEB 10 2009

MEMORANDUM

TO: Division of Aquatic Resources, Division of Forestry and Wildlife,
Division of Conservation and Resource Enforcement, Historic
Preservation Division, Division of Boating and Ocean Recreation, Hawaii
District Land Agent, Engineering Division, Division of State Parks

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

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application HA-3496
Proposed Hawaii Oceanic Technology, Inc. Aquaculture Project

APPLICANT: Hawaii Oceanic Technology, Inc.

REQUEST: CDUA Permit and Lease State Marine Waters for
Aquaculture Facility

LOCATION: Offshore Malae Point, North ~~Kona~~ ^{KOHALA}, Island of Hawaii

PUBLIC HEARING: YES X NO

2009 MAR 10 A 11:54
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
HISTORIC PRESERVATION
CONSERVATION
DISTRICT LANDS

Attached please find a copy of the subject CDUA, and our Department's Notice of Acceptance. We would appreciate your review and comment on this CDUA by the suspense date by **March 6, 2009**. We are including a copy of the Draft Environmental Impact Statement. Should you require additional information please call Dawn Hegger at the OCCL 587-0380. If no response is received by the suspense date, we will assume there are no comments.

() Comments Attached

No Comments

After review of attached material.

Signature

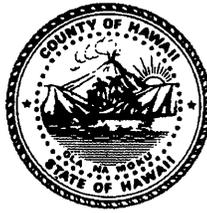
2-26-09

Date

WT

William P. Kenoi
Mayor

William T. Takaba
Managing Director



County of Hawai'i
DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
www.co.hawaii.hi.us

Warren H. W. Lee
Director

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& COASTAL LANDS

2009 MAR 11 A 8:54

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

March 6, 2009

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hi., 96809

Subject: Conservation District Use Application (CDUA) HA-3496
Request for Lease for Marine Waters for the Hawaii Oceanic Technology,
Inc. Aquaculture Project. Offshore Waters of Malae Point, North Kohala,
Island of Hawaii

We have reviewed the above mentioned application and have no comments.

If you have any questions, please contact Kiran Emler of our Kona office at 327-3530.

Galen M. Kuba, Division Chief
Engineering Division

KE

c: ENG-HILO/KONA

Section 2

Letters from Individuals and Non Government Agencies and Responses

AQUACULTURE Planning & Advocacy LLC

47-215 Iuli Street, Kaneohe, HI 96744

808-239-8316

jskorbin@aol.com

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR -7 A 10: 12

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 6, 2009

Ms. Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Hegger:

I want to provide comments on the proposed Hawaii Oceanic Technology, Inc. (HOT) offshore aquaculture project to be located off Malae Point, North Kohala, Island of Hawaii. I understand this forward-looking project desires to lease 247 acres of State marine waters approximately 2.6 nautical miles seaward of Malae Point for culture of yellow fin and big eye tuna; two highly marketable species. Farming activities using innovative, untethered cage technology would scale up to production of 6000 U.S. tons of fish by 2014. These comments focus on the ocean aspects of the project.

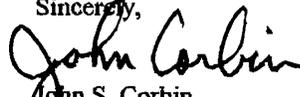
Several Hawaii aquaculture companies are currently leading the nation in commercialization of large-scale offshore farming, thanks in part to supportive government policies. The State and the Legislature have historically encouraged the development of sustainable, land based aquaculture to expand and diversify the Hawaii economy and extending these efforts to use of State marine waters is consistent with these efforts. Moreover, the severe economic downturn of the past year underscores the strong need for nurturing local industry, such as aquaculture, that contributes to our recession resistance and food security.

HOT is proposing a highly innovative project that would demonstrate new combinations of existing technologies, as well as, new technologies to farm the open ocean in a way previously not seen. Successfully demonstrating large-scale, untethered, self propelled cage culture of tuna could greatly further Hawaii's leadership role in aquaculture. Commercial-scale demonstration of the integration of these various systems would "open the door" to making the deep ocean environment far from shore more productive for society through marine farming.

Cage culture of fish in the open ocean does convey environmental advantages as described in the permit application and Draft Environmental Impact Statement. Submergeable cages address concerns over transit by commercial and recreational vessels. The open ocean environment several miles offshore, with a depth of over 1300 feet, provides ample opportunity for mixing and assimilation of fish waste products and uneaten feed pellets. In addition, the "closed loop process" of securing tuna fingerlings from a land based, hatchery-maintained broodstock, minimizes concerns over impacts on wild stocks. Finally, I note safeguards are planned to address the possibility of the high tech cage positioning system malfunctioning.

In summary, the HOT project has the potential to be very economically beneficial to Hawaii by creating jobs and revenues, producing seafood for the local market and export, and producing technological innovation that will foster new ways to farm the ocean. Further, I note the comprehensive job done by HOT on the Cultural Resources Impact Assessment - an area where community concerns have prevented other proposed cage projects for this general location from going forward. In conclusion, I support the HOT project concept and its proposal to lease State marine waters for tuna aquaculture.

Sincerely,


John S. Corbin
President

cc Tetrattech

May 18, 2009

John Corbin, President
Aquaculture Planning & Advocacy LLC
47-215 Lulu St.
Kaneohe, HI 96744

Dear Mr. Corbin,

Thank you for your April 6, 2009 letter of support for the Hawaii Oceanic Technology offshore ahi aquaculture project. We agree that the State and the Legislature have historically encouraged such projects and also agree that expect our efforts to help expand and diversify the economy in these difficult economic times.

We also agree with your conclusion that a successful demonstration of the innovative technology we plan to use to farm the open ocean will further Hawaii's leadership role and "open the door" to making the deep ocean environment a more practical and productive marine farming location.

We have endeavored to design a system and operating plan that addresses concerns over transit by commercial and recreational vessels, ample opportunity for mixing and assimilation of fish waste and creation of a true "closed loop process" of securing tuna from hatchery to plate that will minimize impacts on wild stocks. We also address the unlikely consequence of malfunction with a variety of backup plans and safeguards.

At the same time we anticipate significant job creation from direct hires and contractors, taxable revenues through export of quality product and sensitivity to Hawaii need for a sustainable supply of seafood if required. In addition we have been very careful to understand and address the cultural concerns of the community in which we plan to operate.

Thank you for your thoughtful letter of support.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813



Pacific Planktonics
73-998 Ahikawa St., Kailua-Kona, HI 96740-9407
Office Tel: (808)325-1761. Farm Tel 326-1180
email: kraul@hawaiiintel.net

RECEIVED
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AND COASTAL LANDS

2009 APR -7 A 7:48

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 6, 2009

FROM: Syd Kraul,
Small business owner, resident of the Island of Hawaii, veteran fish
scientist, and kamaaina who cares about out state.

TO: Dawn Hegger
Office of Conservation and Coastal Lands, DLNR
Fax: (808) 587-0322

Hawaii Office of Environmental Quality Control (OEQC)
Fax: (808) 586-4186

SUBJECT: Support Letter for Hawaii Oceanic Technology's Ahi Aquaculture Project

I support Hawaii Oceanic Technology's (HOT) proposal to raise Ahi off of the coast of North Kohala. HOT's proposed project has an environmentally friendly approach to solving the growing demand for seafood. Most of the risks in this project are financial, not environmental. Waters at the proposed site are much different than the oft-cited low-current shallow inlets of the west coast of North America. The benefits far outweigh any potential negative impact. All ocean bottoms are primarily sediment and fish poop will benefit, rather than hurt the bottom. Fish escape? Please let me know so I can go fishing.

The recent turn down in the world economy is negatively affecting many of us that are employed in aquaculture who are struggling to remain in business. The much needed addition to the local economy will be much appreciated by me and my fellow residents of the Big Island.

Sincerely,

Syd Kraul, owner
Pacific Planktonics
73-998 Ahikawa St.
Kailua-Kona, HI 96740

CC: George Redpath
Tetrattech Fax: (808) 533-3306

May 18, 2009

Syd Kraul
Pacific Planktonics
73-998 Ahikawa St.
Kailua-Kona, HI 96740-9407

Dear Mr. Kraul,

Thank you for your letter of support for the Hawaii Oceanic Technology Ahi Aquaculture Project.

We are glad that you agree that our approach is environmentally friendly and that we are working to solve the growing demand for seafood. We agree with your conclusion that waters at the proposed site off of North Kohala are much different than the low current shallow inlets of the west coast of North America. We agree with your assessment that ocean bottoms are primarily sediment and fish poop will benefit rather than hurt the ocean. This has been documented in recent research, see <http://www.sciencedaily.com/releases/2009/01/090115164607.htm>

Our project will help the Big Island economy and the Hawaii economy as a whole in terms of taxable to the state, the employment of several people and contract workers we expect to involve in our project.

As a veteran aquaculture scientist and Kama'aina who cares about Hawaii, we very much appreciate your enthusiasm for our project and hope to work with you in achieving our vision.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

Ross Fulmer
The Fulmer Group Inc.
62-2146 Ouli Street
Kamuela, HI 96743

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -7 A 8:48

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dear Ms. Hegger, I am writing to offer my support for Hawaii Oceanic Technology's application to operate an aquaculture farm in Hawaiian waters. Having been witness to the decline of Hawaiian based industries over the past 35 years, I believe it is critical at this point to truly support diversified agriculture. Both on land and in the sea. This represents an opportunity to for Hawaii to be on the cutting edge of an industry that is growing worldwide.

Sincerely,



Ross Fulmer
President, The Fulmer Group Inc.

p.s.

For the record, neither I nor anyone in my company have any involvement with Hawaiian Oceanic Technology.

Cc:
OEQC
g.r.

May 18, 2009

Ross Fulmer
The Fulmer Group, Inc.
62-2146 Ouli Street
Kamuela, HI 96743

Dear Mr. Fulmer,

Thank you for your letter of support for Hawaii Oceanic Technology's application to operate an aquaculture farm in Hawaiian waters received by the Department of Land and Natural Resources on April 7, 2009.

We agree that this project will help diversify agriculture that has been in decline over the past 25 years as you have observed.

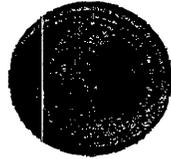
We hope to provide several jobs, employ contractors and in general improve tax revenues based on the projected revenues from our project.

We agree that Hawaii has become the "Silicon Valley" of aquaculture and hope that our cutting edge technology and environmentally responsible approach will contribute to Hawaii's growing worldwide reputation.

Sincerely,



William A. Spencer
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813



KOLOHALA
VENTURES

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -8 A 10: 55

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 8, 2009

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Dear Dawn Hegger:

I am writing in support of Hawaii Oceanic Technologies Inc.'s (HOT Inc.) Draft Environmental Impact Statement (DEIS) and Conservation District Use Application. The HOT Inc. project will help to meet the worldwide growth in demand for seafood protein without harming the environment. This project provides both a sustainable and environmentally responsible use of ocean resources and contributes to the overall state economy. Aquaculture is a nature fit for Hawaii; it creates jobs and protects our dwindling ocean resources. Hawaii's ocean lease law was established to enable companies like HOT, Inc. to do this type of business. Hawaii's seafood exports have suffered from the rising cost of fuel and the dwindling amount of tuna that can be caught in Hawaiian waters. We need to create new industries to help Hawaii compete in this new environment.

HOT, Inc. takes advantage of some very exciting technology that uses both renewable energy sources (Ocean Thermal Energy Conversion) and unique fish farming techniques. Because of its unique design and technology, HOT, Inc. proposes to locate its operations far from shore. This will allow the project to avoid potential conflicts with fishermen, boaters, and those who use the near shore waters for recreation and subsistence fishing. HOT Inc. combines the best of breed fish farming techniques with new and exciting technologies.

I urge you to support HOT Inc. to move forward with its operations here in Hawaii.

Kolohala Ventures, founded in 2006, is an early-stage venture capital firm committed to investing in Hawai'i companies with a global reach.

Sincerely,



Chenoa Farnsworth
Partner
Kolohala Ventures

c: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813

May 18, 2009

Chenoa Farnsworth, Partner
Kolohala Ventures
Pioneer Plaza, Suite 1502
900 Fort Street Mall
Honolulu, HI 96813

Dear Ms. Farnsworth,

Thank you for your letter of support of Hawaii Oceanic Technology, Inc.'s Draft Environmental Impact Statement and Conservation District Use Application.

We agree that this project will help meet worldwide growth in the demand for seafood in an environmentally responsible manner. We also agree that this project will contribute to the economy of the state of Hawaii by creating jobs, hiring contractors and producing taxable revenues for the state.

As you point out, the law that was established to enable companies like ours to perform mariculture in state waters gives us an important strategic advantage that has also been demonstrated as viable by other companies such as Kona Blue and Cates International.

We are also excited by the opportunity to do cutting edge research and development on ways to do economically sustainable fish farming in an environmentally responsible manner. The analysis incorporated in our DEIS and the careful location of our site allows us to avoid the possibility of conflicts with fisherman, recreational boaters and near shore recreational water users.

Finally, allow me to express my sincere appreciation for your continued financial support of this project since its inception in 2006.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813



Sam J
Lemmo/DLNR/StateHIUS
04/17/2009 04:56 PM

To Dawn T Hegger/DLNR/StateHIUS@StateHIUS
cc
bcc
Subject Fw: HOT EIS

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR 20 A 10: 41

FYI

Samuel J. Lemmo, Administrator ><))))>
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813
Phn (808) 587-0377
Fax (808) 587-0322
www.hawaii.gov/dlnr/occl

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

----- Forwarded by Sam J Lemmo/DLNR/StateHIUS on 04/17/2009 04:45 PM -----



"Neil Sims"
<neil@kona-blue.com>
04/17/2009 04:48 PM

To <Sam.J.Lemmo@hawaii.gov>
cc
Subject HOT EIS

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR 20 A 10: 42

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OFFICE OF CONSERVATION
AND COASTAL LANDS

Dear Sam,

Please find attached (and embedded below, if you have trouble with the attachment) comments from the Ocean Stewards on the HOT proposal.

Thanks, and aloha

NAS
Neil Anthony Sims
President
Ocean Stewards Institute
www.oceanstewards.org
Ph (808) 331 1188 x 201
Cell (808) 989 2438

April 8, 2009

Samuel J. Lemmo
Office of Conservation & Coastal Lands

Department of Land and Natural Resources
PO Box 621, Honolulu, HI 96809-0621

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR 20 A 11: 26

Dear Sam,

r.e. Hawaii Oceanic Technology's permit application. My perspective is both as President of Kona Blue Water Farms, and as Founding President of the Ocean Stewards Institute (www.oceanstewards.org). Ocean Stewards is an open ocean mariculture trade association that is founded on the belief that we should not just grow more fish; we should grow more fish, better.

Ocean Stewards generally supports sustainable growth and responsible research in open ocean mariculture. However, we have a clear policy of not endorsing any specific project. We ask that mariculture permits be evaluated on their individual merits: the experience of the management team, the described business practices, a clear technical vision, and a basis in accepted science. New technology must have a reasonable likelihood of success, and a capacity to improve the seafood supply without significantly impacting the ocean environment.

We encourage regulators and other reviewers of projects to understand fully the potential offered by responsible, sustainable offshore mariculture. Wild fisheries are under enormous pressure due to high demand and declining stocks. Open ocean mariculture, managed in a conscientious manner, will help meet that demand while minimizing impacts on the environment.

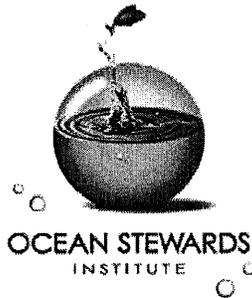
Without a fuller understanding of the technology that HOT proposes for their pens, we are not able to comment on its feasibility. But if HOT can indeed position net pens in oceanic waters without any mooring, then it will be a significant step forward for the industry, and for seafood.

Allowing net pens to be located in deep water could completely address any concerns about potential impacts on the marine environment. As an example, Kona Blue's farm operation, a half-mile off Keahole Point, produced over 500 T of sashimi-grade Kona Kampachi® last year, with no measurable impact on water quality. Further development of open ocean mariculture will continue to cement the State of Hawaii as a leader in pioneering mariculture technology.

We look forward to seeing sustainable, environmentally sound offshore mariculture continue to grow within Hawaii's waters, and throughout the oceans of the world. The need is dire.

Sincerely, with aloha,

Neil Anthony Sims
President
Ocean Stewards Institute



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OFFICE OF CONSERVATION
& COASTAL LANDS

2009 APR 20 A 10:41

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 8, 2009

Samuel J. Lemmo
Office of Conservation & Coastal Lands
Department of Land and Natural Resources
PO Box 621, Honolulu, HI 96809-0621

Dear Sam,

r.e. Hawaii Oceanic Technology's permit application. My perspective is both as President of Kona Blue Water Farms, and as Founding President of the Ocean Stewards Institute (www.oceanstewards.org). Ocean Stewards is an open ocean mariculture trade association that is founded on the belief that we should not just grow more fish; we should grow more fish, better.

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We look forward to seeing sustainable, environmentally sound offshore mariculture continue to grow within Hawaii's waters, and throughout the oceans of the world. The need is dire.

Sincerely, with aloha,

Neil Anthony Sims
President
Ocean Stewards Institute

May 18, 2009

Neil Anthony Sims
President
Ocean Stewards Institute
PO Box 4239
Kailua-Kona, HI 96745

Dear Mr. Sims,

Thank you for your letter regarding Hawaii Oceanic Technology's permit application to the Office of Conservation & Coastal Lands.

Thank you for acknowledging your position for the responsible review of projects such as ours that involve new technology and environmentally responsible mariculture in the open ocean. We appreciate that you agree that if successful our approach for net pens that are located in deep water "could completely address any concerns about potential impacts on the marine environment."

Finally, as do you, we look forward to proving that our approach has the potential of being sustainable, environmentally sound and that it will make a contribution to Hawaii's ability to meet a dire need throughout the oceans of the world.

Sincerely,

A handwritten signature in black ink, appearing to read "William A. Spencer", with a long horizontal line extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

March 23, 2009

Dawn Hegger Office of Conservation and Coastal Lands
Hawaii DLNR
PO Box 621
Honolulu, HI 96809

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 MAR 27 A 8:52

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dear Dawn,

I have been living on the Big Island since 1957 and have been an active participant in most every ocean activity there is along the Kohala Coast. I am today an active sport fisherman on my 25-foot fishing boat, Kakalina. After attending high school here I took a bachelors degree from the College of Life Sciences at Cornell University, and I have maintained an active interest in the Big Island's agricultural struggles as well as our pristine ocean environment.

I have been thinking long and hard about the proposed ahi farming venture off-shore from Mahukona, and in balance I think it is a good thing for the public to support. The simple fact facing you and I and our grandchildren is that mankind will do what mankind has to do to feed itself. When push comes to shove a democratic society will always vote its own immediate self interest, and when it comes to food there is no question society will do what it has to do to create and maintain a high-quality food supply. We should be doing all we can to support early efforts.

This farming venture has gone to exceedingly rigorous lengths to satisfy every conceivable concern, leaving little in the way of responsible protest. The area selected is replete with a current-swept seafloor holding comparatively few resident fish populations and seems to be a very high quality location for a farming enterprise.

I like the fact that this operation is Hawaii based and may peak the interest of our children growing up here. I like the advanced technology and have every confidence that once underway the technology will improve by leaps and bounds as all technology does.

As an off shore fisherman, I am all too aware of the decline we have seen in ahi numbers and sizes as the large harvesters of these roaming fish populations gradually decimate these wild populations. Frankly, anything we can do to take the pressure off these wild populations will be most helpful in maintaining the health of the Pacific Fishery! Having a reliable supply of market-size fish will also create a far more efficient stream of useful product to the restaurants and hotels as well. Under today's conditions there is so much waste having to deal with a fish that is either too small or far too big!

I hope you will consider this written testimony in your deliberations. Folks like me are not inclined to write letters and stir things up, while those members of our society opposed to new developments are far more inclined to broadcast their views and promote the fallacy that they represent the common man.

Thanks for your consideration,



William N Jardine

Big Island Buyer's Brokers
HighCountry Traders 201
65-1291 Kawaihae Road
Kamuela, HI 96743

May 18, 2009

William N. Jardine
Big Island Buyer's Brokers
High Country Traders 201
65-1291 Kawaihae Road
Kamuela, HI 96743

Dear Mr. Jardine,

Thank you so much for your thoughtful letter of support for our Ahi Aquaculture Project on the North Kohala Coast. As a sport fisherman, I am glad that you understand the severe decline in ahi numbers and sizes and the impending decimation of these wild populations of ahi. We agree that farming ahi is one way to take the pressure off the wild fishery and over time improve its health.

We also appreciate that you see the future potential of a project such as ours that over time will help meet the growing demand for seafood in a world hungry for fish protein.

Hawaii is the best place in the United States for this kind of project as it is the only state with a legal regulatory infrastructure with high environmental standards that can be the basis for a high quality fish farming operation such as ours. We look forward to employing local aquaculture students and others and train them in best practices and high technology techniques so that Hawaii can continue to be the world leader in open ocean aquaculture and help show the world economically sustainable and environmentally responsible ways to farm the ocean.

We appreciate your willingness to speak out and express your views about our project so that decision makers are not drowned out by the hundreds of uninformed signers of form letters promoting specious criticisms of our project in the name of the common man.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

4850 Makena Alanui
Makena Surf Condominium Unit E-203
Kihei, HI 96753

March 18, 2009

Ms. Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject : Hawaii Oceanic Technology, Inc.

Dear Ms. Hegger,

I am an investor in Hawaii Oceanic Technology, Inc. and am writing to you in support of the company's Draft Environmental Impact Statement and Conservation District Use Application and the issuance of permits and ocean leases that will allow them to commence operations.

Naturally as an investor I have hopes the enterprise will one day become a profitable entity. There are a number of other reasons that also influenced my decision to invest in this particular venture.

There is no question that there is a significant decline in the seafood protein available from our oceans. Simultaneously there is significant increase in the demand for affordable seafood protein worldwide. I believe that Hawaii Oceanic Technology can begin the help this imbalance in a sustainable and environmentally "neutral" manner.

The company operations will also be beneficial to Hawaiian citizens by providing continuing steady employment. The Hawaiian economy will also be helped by the many suppliers that will be needed to support the company.

Thank you for entertaining my comments with regard Hawaii Ocean Technology.

Very truly yours,



John J. Patterson

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OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 MAR 20 A 9: 28
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

May 18, 2009

John J. Patterson
4830 Makena Alanui
Makena Surf Condominium Unit E-203
Kihei, HI 96753

Dear Mr. Patterson,

Thank you for your March 18, 2009 letter of support for Hawaii Oceanic Technology, Inc.'s Draft Environmental Impact Statement and Conservation District Use application.

We appreciate your investment in the company and your continued support of our business so that one day it will become the profitable enterprise we all envision.

Thank you for acknowledging the driving factors influencing your investment such as the decline in seafood protein from our oceans, the significant increase in world demand and the need to address this pending imbalance through economically sustainable and environmentally responsible fish farming.

We also agree that this project will benefit the citizens of Hawaii in many ways, by offering employment, contracting with existing businesses for services, and the generation of state tax revenues through successful revenue generation.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

Virendra Nath
58 Kahuakai Place
Lahaina, HI 96761

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AND COASTAL LANDS

2009 APR -6 A 9:53

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Fax Transmission: 2 pages

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
fax: (808) 587-0322

Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
fax: (808) 586-4186

With copy to:
George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
fax: (808) 533-3306

Dear Sir or Madam,

I am an investor in Hawaii Oceanic Technologies, Inc. and am writing this letter to support HOT's draft EIS. HOT is attempting to gain licenses to grow ahi in waters off the Big Island of Hawaii.

I invested in the company because I believed then, and do today, that the increase in world population and increased health standards around the world would place an unsustainable burden on fisheries worldwide. So much of the world lives close to coastlines and depends on fish protein to survive. I believed then, and do now, that in 25 years, fish farming would be no different than regular agriculture or chicken raising.

As a participant in high technology investments, I have realized that first mover advantage is crucial to business success. Fish farming, including ahi farming, will be done in many places in the world within the next 25 years. However, if we are smart, we will be able to lead the way and make Hawaii the center for research and development, and more importantly, the source of capital and entrepreneurship in this area. Some have

said that Hawaii has the chance to become the Silicon Valley of large marine aquaculture and I believe that this could happen.

The type of marine aquaculture that HOT will place in waters off the Big Island has been well tested, is sustainable and will create a better product than the competing products from other aquaculture efforts. I can see a day, not far in the future, when HOT's products and technology are licensed to many parts of the world – improving health care and creating a great many entrepreneurial and technical/scientific jobs in Hawaii. All those fish farms will need help to get set up, will need equipment, will need technical support.

In addition to the very good possibility that HOT can become a central player in the export of marine technology, HOT's current business plan is sustainable on its own merits as a producer of high quality ahi tuna. Hawaii's waters are among the cleanest in the world, and the fish grown here would be the least polluted of any. And so, a branding possibility – the best ahi come from Hawaii, much as the best coffee comes from Hawaii. Both grown in the same area of the Big Island.

The request for a license should cause no negative impacts either on land or in the ocean. The farm will be far off shore and it is small enough to be but a speck. The request for a license also meets all the required laws on the books.

There will undoubtedly be some who reflexively oppose the license request. That is their right, and I respect it. However, even a cursory review of the application would show the most skeptical (but open minded) person that this plan has no negative impacts and is sustainable on its own merits. It will not affect the livelihood of fishermen or fishing communities, in fact it may improve both by making "Hawaii fish" a brand worth far more than just the word "fish" – and thus increase the value of the Hawaii fish.

This is a perfect plan and a perfect opportunity for Hawaii. Please approve the draft EIS so that the company can get on with the business of producing ahi and building its technology for export to other growers around the world.

Sincerely,



Virendra Nath

May 18, 2009

Virendra Nath
58 Kahuakai Place
Lahaina, HI 96 761

Dear Virendra,

Thank you for your letter of support received by the Department of Land and Natural Resources on April 6, 2009.

As an investor in Hawaii Oceanic Technology, Inc., we appreciate your continued support of the company and your keen understanding of why our company is important to addressing the need to meet growing world demand for fish protein by farming the ocean as we farm the land.

Thank you for pointing out that Hawaii has a strategic competitive advantage in the world when it comes to aquaculture if we are able to continue to "lead the way." Some have said that Hawaii is the "Silicon Valley of Aquaculture", and your investment in our company is helping to provide the capital that will allow us to begin to achieve this vision.

We also appreciate your understanding about the technology we plan to employ and how it has been well tested in other marine applications and is now ready to be applied to aquaculture. As you mention, Hawaii's ideal conditions for producing a high grade of ahi is a branding opportunity that we have grasped in the trademark, "King Ahi" which will stand for a product of superior quality much like "Kona Coffee" has for the coffee industry.

We look forward to demonstrating that our approach to open ocean aquaculture will have no significant negative impacts, will provide employment, utilize contract services and increase tax revenues from sustainable company revenues.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

Linda Wilson, Resident of the Big Island and Charter Fishing boat Co owner

Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
FAX: (808) 587-0322

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OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -6 A 10:41

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

And,
Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
FAX: (808) 586-4186

March 16, 2009

To whom it may concern,

As a small business owner with my husband, and resident of the Island of Hawaii, I support Hawaii Oceanic Technology's Ahi Aquaculture Project. Businesses are struggling on the Big Island due to the Wall Street Collapse and the resulting drop in tourism. HOT's project will stimulate the local economy in ways that are not presently available, especially for Mariners such as myself.

The project is good for the world's population food demand, good for the local economy and environmentally sound. There will be a significant growth in jobs and taxes paid to the State of Hawaii that is vitally needed with the present economy.

I believe that the production of this food source is one of the biggest reasons for this project. Our "Harvest" is the Ocean in Hawaii that is sustainable and equally important, will increase fish stocks for the future. Please support this important aquaculture effort. Now is not the time to sit on this project and "Study it to death", it is time for action that provides vast opportunity for food and jobs and is supported by sound a valid scientific studies and research that has been on-going for years.

Thank You,



Linda Wilson
77-263 Maliko St.
Kailua Kona, Hawaii 96740

CC: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Fax: (808) 533-3306

May 18, 2009

Linda Wilson
77-263 Maliko St.
Kailua-Kona, HI 96740

Dear Ms. Wilson,

Thank you for your kind letter of support for the Hawaii Oceanic Technology Ahi Aquaculture Project.

We agree with you that small businesses in Hawaii are struggling, especially on the Big Island due to today's economic slowdown. As you point out, our project will create jobs, contract for marine services from local service providers, and generate tax revenues that will help the overall economy in Hawaii.

We appreciate the fact that you understand the need to develop environmentally sound ways to meet the world's increasing demand for fish protein. You are right that ultimately, our objective is to create an environmentally responsible and economically sustainable way to produce seafood and reduce the pressure on wild fish stocks into the future.

Hawaii has the only mature regulatory infrastructure designed to allow operations such as ours to obtain permits and an ocean lease to operate in Hawaiian waters. Our project is built on years of research and the experience of two other pioneering open ocean fish farm operations that have demonstrated that projects such as our will have no significant negative impacts on the environment.

We look forward to your continued support.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spender', with a long horizontal flourish extending to the right.

William A. Spender, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

David Kris Kopra
3rd Officer United States Merchant Marine
PO Box 6013, Kamuela HI, 96743

Hawaii Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, HI 96813

March 26, 2009

To whom it may concern

I, David Kris Kopra would like to submit public opinion in support of Hawaii Oceanic Technology, Inc.'s proposed Ahi Aquaculture project off the Big Island's Kohala Coast. After reading and reviewing the DEIS, I feel it is thorough and inclusive. The DEIS satisfies my questions of the projects impacts and outlines proper monitoring systems that are critical to the operation.

The proposed project has many possible effects on the ocean area, harbor, and local industry where I live. As a resident of Kamuela this project has many different pathways of impact to the communities to which I belong.

I am a member of the community that uses the Kohala Coast for water recreation. I was raised diving and fishing the coast east, of the proposed ocean lease area. The DEIS is accurate in its analysis of the coastal area. The waters off Malae Point, North Kohala are ideal for an open ocean aquaculture project. As a diver, fishermen, kayaker, and coastal user, I support the project for its location choice, and concur with the location analysis from chapter 2 of the DEIS.

As a local Captain for sail charters and First officer aboard tug vessels, I am a member of the local maritime industry based out of Kawaihae. The proposed H.O.T project will impact the community of charter vessels based in Kawaihae through two main routes. The first is in harbor and facilities usage which has been addressed in the DEIS. As an operator of multiple vessels in Kawaihae harbor, I encourage the development of more industry within the harbor. This will help the currently financially strained Harbor's Division with upkeep of this pertinent facility. The most restrictive factor to the North Kohala maritime industry is the harbor facilities and upkeep. The addition of more vessels utilizing the harbor will not hinder any of the current operations. The commercial water based capacity of the harbor is nowhere close to realized. The second route of impact is in the occupation of the proposed ocean lease site, by the support vessels and "Oceansphere" fish pens. I have transited the area proposed on many occasions. The site occupation will not hinder the safe passage of fishing vessels or charter vessels, as there is adequate sea room to transit all around the site. I personally feel that the site will become an attraction and point of interest. Drawing attention from around the globe,

as the most technologically advanced aquaculture project, it will stimulate the local charter industry. As a member, of the commercial harbor users, I welcome the vessels and activities of the proposed aquaculture project.

I was raised in Waimea and left to attend a professional Maritime Academy in California, where I studied the Maritime Industry and Admiralty Law. My goal was a profession that would keep me in the ocean and living on the Big Island. My current contract to the United States Navy, takes me around the world serving our Country as a ships Officer. At home in Hawaii I am frequently asked to speak with high school juniors and seniors about careers in the Maritime Industry. There is a large group of youth on the big island interested in pursuing professional careers that involve their favorite element, the ocean. I speak to these kids about my experiences working in Hawaii for interisland tow boats, UH research vessels, and Matson container ships. I tell them about the international opportunities available in the Maritime Industry. It seems that at each of these meetings the interest of the students directs the conversations to local opportunities. If this project is allowed to advance, we could create here in our local community not only the immediate jobs in the maritime industry, but a training ground for the professionals of the open ocean aqua culture industry. We have the opportunity to expose Hawaii students to an industry that is going to explode around the world.

As a professional in the maritime field I have witnessed what is imported and exported from Hawaii. I have driven the ships that bring containers full of food to the islands and empty containers back overseas. I have watched as we import not only commodities but individuals, professionals in the maritime industry to meet our need. The aqua culture project could serve to assist us in developing and training the individuals of our communities. I support this project and the approval of the project's ocean lease and Conservation District Use Permit in the same respect as I support our youth finding jobs in the maritime industry. We could build a workforce and resource of experienced professionals in the aquaculture industry to export overseas.

The world is plagued with hunger, the land resources are dwindling, and the natural fish stocks of the oceans are in danger. It is time that the fishermen of the world become farmers. The world will start to farm the open ocean, let us lead the way here in Hawaii. The technology and techniques that are developed in the course of this project can benefit not only the residents of Hawaii but the people of the world. I, David Kris Kopra support the issuance of the requested permits and leases to Hawaii Oceanic Technology, Inc. I would also like to thank the Board for serving our Hawaii community.

Mahalo,
David Kris Kopra
PO Box 6013, Kamuela Hi, 96743

May 18, 2009

David Kris Kopra
3rd Officer United States Merchant Marine
PO Box 6013
Kamuela, HI 96743

Dear Mr. Kopra,

Please accept our sincere thanks for your compelling letter in support of the Hawaii Oceanic Technology Ahi Aquaculture project off the Big Island's Kohala Coast.

Your careful study of our Draft Environmental Impact Statement demonstrates that you have a keen understanding of why this project is so important to Hawaii, its youth and the need to find better ways to meet the world's insatiable demand for seafood protein.

In particular, we appreciate your vast experience as a maritime industry professional and your understanding how our project will have a positive effect on the utilization of the commercial capacity of Kawaihae harbor. We also respect your understanding of our proposed lease site and why we think it is the ideal place of an open ocean aquaculture project.

Thanks to Hawaii's ocean lease law and environmentally attentive permitting process, we think that our project can have a competitive edge in fulfilling the vision that Hawaii is the "Silicon Valley of Aquaculture." We think that our project has the potential to create a variety of jobs that will attract our youth, and help train a new cadre of aqua culturists who can move on to increase this industry in Hawaii and around the world.

As you note, Hawaii imports 80% of the food we consume including seafood. The Pacific tuna fishery is on the verge of collapse. Hawaii has the opportunity to lead the way. Your experience, long term commitment to the Big Island community and support for this project will go a long way to helping us get the permits and leases we need to fulfill a vision that is good for Hawaii. Again, our warmest Mahalo for your support.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

David C. Bangert, Ph.D.
519C Keolu Drive
Kailua, HI 96734
808 293 2981

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS

2009 MAR 12 A 8: 08

March 10, 2009

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
and
Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813

I am proud to support this social enterprise with funding. It is a triple bottom line effort. This project addresses the need to meet worldwide growth in demand for seafood protein without harming the environment. Hawaii needs a sustainable and environmentally respectful way to use our vast ocean as a resource to contribute to the overall state economy while being culturally appropriate. Fish farming is a good business to support in Hawaii. We need the jobs the business will help create.

Hawaii's ocean lease law was established to enable companies like Hawaii Oceanic Technology, Inc. to do this type of business. Let's give this law a chance to work and help this company succeed.

Hawaii's seafood exports have suffered from the rising cost of fuel and the dwindling amount of tuna that can be caught in Hawaiian waters. Projects like this are good for the Hawaii economy. Technology is germane to Hawaii's survival into the future. The technology that Hawaii Oceanic Technology, Inc. proposes is very exciting and can help Hawaii become a leader in open ocean fish farming.

I support this plan because the company is using Ocean Thermal Energy Conversion to reduce the cost of putting food on the table. We are surrounded by ocean, but it is only used for commercial and sport fishing, transportation and tourism. It is time to farm the ocean like we farm the land. It uses the ocean instead of Hawaii's scarce land resources to produce food in an environmental friendly way.

Many commercial fisheries are experiencing serious decline, including different types of tuna fisheries. Because Hawaii Oceanic Technology will only use wild Ahi as broodstock to spawn and produce fingerlings that will be grown to market size, this

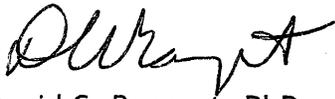
proposed project offers a way to produce high quality tuna without putting more fishing pressure on the wild stocks of fish. Hawaii's maritime industry is in a major economic slowdown. This project will be a boost to these local maritime businesses when they need it most.

Because of its unique design and technology, Hawaii Oceanic Technology proposes to locate its operations far from shore. This will allow the project to avoid potential conflicts with fishermen, boaters, and those who use the near shore waters for recreation and subsistence fishing.

The DEIS is comprehensive and complete. DLNR is correct in its Finding of No Significant Impact. This proposed project is the right kind of use of these conservation lands in the ocean and I encourage DLNR to accept the Conservation District Use Application for Hawaii Oceanic Technology. It will help strengthen Hawaii's bio-security by producing a food source locally, and not depending only on imports to satisfy local demand.

This project will help ensure that the US population will have a new safe source of fresh seafood entirely grown under strict US laws. Hawaii imports 70% of its food and it is about time that we become more self sufficient.

Sincerely yours,



David C, Bangert, PhD

cc.

George Redpath

Tetrattech

737 Bishop Street, Suite 3020

Honolulu, HI 96813

May 18, 2009

David C. Bangert, Ph.D.
519 C Keolu Drive
Kailua, HI 96734

Dear Dr. Bangert,

As an investor in Hawaii Oceanic Technology, Inc. we appreciate your support and your keen understanding of the social value of this enterprise. We agree with your assessment that the project will address several needs including the increasing demand for seafood protein in an economically sustainable and environmentally responsible manner. Indeed fish farming is a perfect business for Hawaii and our government leaders were very insightful in their making of a law to allow and carefully regulate this industry.

If allowed to continue we will create meaningful jobs at several levels, contract for services from fisherman, fish processors and others, and generate tax revenue producing income that will help the state diversify its economy in a way that respectfully uses the ocean that surrounds us.

As you are aware, the commercial tuna fisheries throughout the Pacific are suffering. By implementing a closed loop process that starts with fertilizing eggs from local ahi and grows them out to plate size, we will be reducing the impact on the fishery while providing a clean Hawaii grown product to an insatiable market.

Thank you also for pointing out that our technology will allow us to operate far from shore minimizing impacts on recreational and commercial users of our near shore waters.

I am glad you believe that our DEIS is comprehensive and complete and concur with the initial finding of DLNR that it expects the project to have "no significant impact."

We appreciate your continued support for this project.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813



UNIVERSITY
of HAWAII
MANOA

OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 MAR 16 P 3: 54 March 16, 2009

DEPARTMENT OF
NATURAL RESOURCES
STATE OF HAWAII

Office of Conservation and Coastal Lands
State of Hawai'i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Via fax: (808) 587-0322

Dear Sir or Madam:

I am writing in support of the **Ahi Aquaculture Project**, which in my opinion, should move forward and receive an Ocean Lease for an offshore aquaculture site located three miles off shore of **North Kohala coast Island of Hawai'i**. This project addresses the need to meet worldwide growth in demand for seafood protein without harming the environment.

Hawai'i needs a sustainable and environmentally respectful way to use our vast ocean as a resource to contribute to the overall state economy. Fish farming is a good business to support in Hawai'i and we need the jobs the business will help create. Hawai'i's ocean lease law was established to enable companies like Hawai'i Oceanic Technology, Inc. to do this type of business. Let's give this law a chance to work and help this company succeed. Hawai'i's seafood exports have suffered from the rising cost of fuel and the dwindling amount of tuna that can be caught in Hawaiian waters. The technology that Hawai'i Oceanic Technology, Inc. proposes is very exciting and can help Hawai'i become a leader in open ocean fish farming.

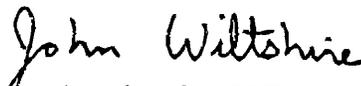
We are surrounded by ocean, but it is only used for commercial and sport fishing, transportation and tourism. It is time to farm the ocean like we farm the land. I like this plan because it uses the ocean instead of Hawai'i's scarce land resources to produce food in an environmental friendly way. Many commercial fisheries are experiencing serious decline, including different types of tuna fisheries. Hawai'i's maritime industry is in a major economic slowdown. This project will be a boost to these local maritime businesses when they need it most. Because of its unique design and technology, Hawai'i Oceanic Technology proposes to locate its operations far from shore. This will allow the project to avoid potential conflicts with fishermen, boaters, and those who use the near shore waters for recreation and subsistence fishing.

Letter to OCCL, State of Hawai'i
Via fax: (808) 587-0322
March 16, 2009
Page 2 of 2

It is good to see a Hawai'i based company proposing to grow ahi in Hawai'i. That's what Hawai'i's ocean leasing law is supposed to achieve. This proposed project will help strengthen Hawai'i's bio-security by producing a food source locally, and not depending only on imports to satisfy local demand.

This project will bolster Hawai'i's unique advantages of having world class marine scientists and engineers along with the availability of vast resources in our extensive exclusive economic zone and allow the people of Hawai'i to compete in the new world economy. The entire conceptual framework of the Ahi Aquaculture Project is to create a reliable and safe seafood source in a completely sustainable and environmental friendly manner and I wholeheartedly support it.

Sincerely,



John C. Wiltshire, PhD
Chairman
Department of Ocean and Resources Engineering

Cc: Mr. George Redpath
Tetra Tech, Inc.

May 18, 2009

John C. Wiltshire, Ph.D.
Chairman
Department of Ocean and Resource Engineering
School of Ocean and Earth Science and Technology
University of Hawaii at Manoa
2540 Dole Street, Holmes Hall 402
Honolulu, HI 96822

Dear Dr. Wiltshire:

Thank you for your important letter of support for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture project. As a member of our board of advisors, you have intimate knowledge of our planned operation. From that perspective, your comments about our plans to provide a sustainable and environmentally respectful way to use our vast ocean as a resource that contributes to the economy of Hawaii is particularly meaningful.

As a scientist and ocean engineer it is encouraging that you favor our technical approach while understanding the economic and social pressures that are forcing companies like ours to find innovative ways to farm the ocean like we farm the land.

Hawaii produces world class marine scientists and ocean engineers that give us the opportunity to employ the best and the brightest minds to help meet the challenges ahead.

We agree with you that Hawaii's ocean lease law gives the state a unique opportunity to develop a business that can provide both a local source of food as well as develop a technology for off shore open ocean fish farming that can be used throughout the world.

We appreciate your wholehearted support and look forward to your continued role as an advisor to the company.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

Chuck Wilson, Resident of the Big Island and Charter Fishermen

Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
FAX: (808) 587-0322

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -6 A 10:41

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

And,
Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
FAX: (808) 586-4186

March 16, 2009

To whom it may concern,

As a small business owner and resident of the Island of Hawaii, I support Hawaii Oceanic Technology's Ahi Aquaculture Project. Businesses are struggling on the Big Island due to the Wall Street Collapse and the resulting drop in tourism. HOT's project will stimulate the local economy in ways that are not presently available, especially for Mariners such as myself.

The project is good for the world's population food demand, good for the local economy and environmentally sound. There will be a significant growth in jobs and taxes paid to the State of Hawaii that is vitally needed with the present economy.

I believe that the production of this food source is one of the biggest reasons for this project. Our "Harvest" is the Ocean in Hawaii that is sustainable and equally important, will increase fish stocks for the future. Please support this important aquaculture effort. Now is not the time to sit on this project and "Study it to death", it is time for action that provides vast opportunity for food and jobs and is supported by sound a valid scientific studies and research that has been on-going for years.

Thank You,



Charles Wilson

CC: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Fax: (808) 533-3306

May 18, 2009

Charles Wilson
77-263 Maliko St.
Kailua-Kona, HI 96740

Dear Mr. Wilson,

Thank you for your kind letter of support for the Hawaii Oceanic Technology Ahi Aquaculture Project.

We agree with you that small businesses in Hawaii are struggling, especially on the Big Island due to today's economic slowdown. As you point out, our project will create jobs, contract for marine services from local service providers, and generate tax revenues that will help the overall economy in Hawaii.

We appreciate the fact that you understand the need to develop environmentally sound ways to meet the world's increasing demand for fish protein. You are right that ultimately, our objective is to create an environmentally responsible and economically sustainable way to produce seafood and reduce the pressure on wild fish stocks into the future.

Hawaii has the only mature regulatory infrastructure designed to allow operations such as ours to obtain permits and an ocean lease to operate in Hawaiian waters. Our project is built on years of research and the experience of two other pioneering open ocean fish farm operations that have demonstrated that projects such as our will have no significant negative impacts on the environment.

We look forward to your continued support.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

TO: Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
Fax: (808) 587-0322

2009 APR -6 A 11: 45

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
Fax: (808) 586-4186

FROM: Van Malan, Software Engineer and resident of Kailua-Kona, Island
of Hawaii

SUBJ: Support Letter for Hawaii Oceanic Technology's Ahi Aquaculture
Project

DATE: April 6, 2009

Dear Sir/Madam,

I whole heartily support Hawaii Oceanic Technology's (HOT) proposal to
raise Ahi off of the coast of North Kohala. Due to the bad economy
many of us that are employed in the High Technology sector are in fear
of losing employment. HOT has a sound and environmentally friendly
approach to solving the growing demand for seafood. The much needed
burst to the local economy will be much appreciated by me and my
fellow residents of the Big Island.

Sincerely,



325-5223

Van Malan

CC: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Fax: (808) 533-3306

May 18, 2009

Van Malan
73-1370 Kinoulu Place
Kailua Kona HI 96740

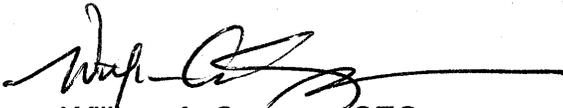
Dear Mr. Malan,

Thank you for your letter expressing whole hearted support for our Ahi Aquaculture project off of the coast of North Kohala.

We agree that Hawaii needs to diversify the economy to that high employment due to impacts on the tourism economy can be avoided. We agree that there are talented people in Hawaii that can help grow businesses such as our that are designed to produce ahi in an environmentally friendly manner.

We are glad you agree with our approach and promise to work hard to boost the economy with jobs, contractor relationships and revenues that will generate taxes that support the state of Hawaii.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. Spence', with a long horizontal line extending to the right.

William A. Spence, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

Sierra Tobiason
Graduate Student
Tropical Conservation and Environmental Science Masters Program
University of Hawaii at Hilo
Hilo, HI 96720

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OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -9 A 7:48

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
Fax: (808) 587-0322

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
Fax: (808) 586-4186

DATE: April 7, 2009

To whom it may concern,

I support Hawaii Oceanic Technology's (HOT) proposal to raise Ahi off of the coast of North Kohala. I am currently working on my Masters Degree at the University of Hawaii at Hilo focusing on Tuna Broodstock development in Hawaii. After I graduate from the UH Hilo, I would very much like to continue working on the HOT Ahi Tuna Aquaculture Project and be able to continue to live on the Island of Hawaii. Please consider the economic consequences involved to the residents of the Big Island in refusing HOT's lease.

HOT's proposed project has a sound and environmentally friendly approach to solving the growing demand for seafood. The much needed addition to the local economy will be much appreciated by me and my fellow residents of the Big Island.

Sincerely,


Sierra Tobiason

CC: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Fax: (808) 533-3306

May 19, 2009

Sierra Tobiason
Graduate Student
Tropical Conservation and Environmental Science Masters Program
University of Hawaii at Hilo
Hilo, HI 96720

Dear Sierra,

Thank you so much for your letter of support for the Hawaii Oceanic Technology proposal to raise Ahi off of the coast of North Kohala.

Our company is devoted to creating quality jobs in Hawaii for students such as yourself who are working hard on getting the training you need for a career in ocean science and the environment.

We are very concerned about the need to diversify the economy in Hawaii and especially as it pertains to supplying the state with sustainable sources of quality seafood protein. We realize that this is a global problem where Hawaii has a competitive strategic advantage due to our vast ocean surroundings and technical expertise, especially in aquaculture.

Please keep up your good academic work and we promise to continue to work hard to be in a position to provide the kinds of jobs that will allow you to work in your field of choice and stay in Hawaii.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long, sweeping horizontal line extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

From: Adam Daw,
Aquaculture Education Specialist at PACRC, UH Hilo, working with HOT on the Ahi Tuna Aquaculture Project

RECEIVED
OFFICE OF CONSERVATION
DEPT. OF LAND & NATURAL RESOURCES

To: Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809
Fax: (808) 587-0322

2009 APR -9 A 7:47

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Hawaii Office of Environmental Quality Control (OEQC)
235 South Beretania Street, Suite 702
Honolulu, HI 96813
Fax: (808) 586-4186

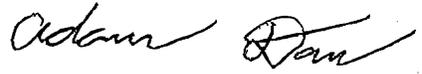
DATE: April 8, 2009

Dear Dawn Hegger,

I support Hawaii Oceanic Technology's (HOT) proposal to raise Ahi off of the coast of North Kohala. I would very much like to continue working on the HOT Ahi Tuna Aquaculture Project and be able to continue to live on the Island of Hawaii. Please consider the economic consequences involved to the residents of the Big Island in refusing HOTs lease.

I believe that this project will help Hawaii in many aspects from being able to produce our on food locally, minimizing our reliance on foreign imports and wild tuna stocks. It will also help expand the local and state economy by adding jobs and revenue. Also, I believe that it will serve as a current and future model for sustainable and environment friendly aquaculture.

Sincerely,



Adam Daw

CC: George Redpath
Tetrattech
737 Bishop Street, Suite 3020
Honolulu, HI 96813
Fax: (808) 533-3306

May 19, 2009

Adam Daw
Aquaculture Education Specialist
Pacific Aquaculture and Coastal Research Center
University of Hawaii at Hilo
Hilo, HI 96720

Dear Mr. Daw,

Thank you so much for your letter of support for the Hawaii Oceanic Technology proposal to raise Ahi off of the coast of North Kohala.

We are very concerned about the need to diversify the economy in Hawaii and especially as it pertain to supplying the state with sustainable sources of quality seafood protein. We realize that this is a global problem where Hawaii has a competitive strategic advantage due to our vast ocean surroundings and technical expertise, especially in aquaculture.

We are devoted to environmentally responsible and economically sustainable seafood production and with the help of organizations like PACRC, we are able to rapidly prove our business model and get closer to achieving our goal. We look forward to continuing to work with you.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long, sweeping underline that extends to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
PO Box 621, Honolulu, Hi. 96809
FAX 808-587-0322

4/9/09

Ms. Hegger,

I am writing to provide a letter of support for the Kohala Coast Ahi Aquaculture Project detailed in the Draft Environmental Impact Statement by Hawaii Oceanic Technology [HOT]. I have been an advisor of HOT since shortly after its' founding due to my concern for over-fishing of tuna, and recognition that new approaches to aquaculture should be possible with significant improvements in a number of areas.

First, some background on the larger issue. I have periodically attended World Aquaculture Society conferences since about 1987. Several years ago at a meeting on Oahu I noticed six Department of Homeland Security personnel in attendance at one such meeting for the first time. When I asked what they were doing there, they informed me of the health risk posed to US citizens by imported seafood, which in dollar value ranks second only to petroleum products as a single import contributing to the US trade imbalance. Most of the imported seafood is caught or cultured in countries where regard for sustainable fishing is minimal, and where aquaculture operations are performed in waters likely to be contaminated by human or animal waste, or subject to other disease organisms. Often there is the added risk that species in foreign aquaculture systems are fed large doses of antibiotics, leading to additional risk of the import into the US of drug-resistant microbial diseases of fish and humans in association with these products. All these issues indicate imported fishery products currently pose a food and health security risk to the United States, as the DHS personnel confirmed.

I have long been a critic of salmon and other aquaculture facilities in the past, which have not always been managed by the necessary team of professionals ready to monitor for, and respond to, the occurrence of fish diseases. However the disease problems most often arise simply because of inappropriate and avoidable practices. I grew up in the Philippines where maritime aquaculture was a part of coastal culture, and continued to be sustainably practiced, as it had been for many generations, certain proof that it is possible to conduct aquaculture sustainably, as the Hawaiians themselves did in their many fishponds. I believe the methods proposed by Hawaii Oceanic Technology are specifically intended to address most of the problems of the past, and merit evaluation in Hawaii, where existing marine aquaculture projects have already played a role in raising the profile of Hawaii as a leader in advanced marine aquaculture efforts.

I would like to address some of the issues in the EIS specifically, and some others generally to focus the specifics of my support for the HOT aquaculture project. First, HOT followed my advice and immediately included Dr. Jo-Ann Leong on their board of advisors, an internationally known expert in fish viral diseases, and also

a State of Hawaii certified fish parasitologist as well. This indicated to me they were serious about monitoring the health of the fish they intend to culture with state of the art methods. Moreover, it is important that both these individuals, like myself, have no financial stake in HOT, and perform their diligence in advising this company as effective third parties, as will others be who monitoring the progress of this project.

Regarding the specifics of the HOT EIS, first, the Malae site selection is useful and important in avoiding conflicts with most other humans using the ocean around Hawaii. The intended site is in deep water. This not only minimizes interaction with humans, it is important to avoid recruitment of potential disease organisms or parasites from shallow coastal marine sediments. The Malae offshore site location is simply not close enough to these areas to attract such species. Finally, the intended site is in an area of very dynamic currents. While the methods proposed for monitoring feeding should avoid any excess feeding by watching fish behavior and cutting off food supply in advance of fish satiation, there will be liquid and solid waste from the fish, as from all living organisms, and the currents and water depth are sufficient to dilute this within minutes to background levels with no predictable impact on water column or benthic environments. I can say this having contributed key papers to the argument which led to the end of dumping of human sewage in the sea off New York City in 1981, and having studied such issues at length.

It is also important that the intended site is in water deep enough that it will not affect either any adjacent koas (traditional fish aggregating sites), or the known migration routes of fish species, or marine mammal species. The cages are too far offshore to affect reef fish, and it is highly unlikely that these cages will significantly change or affect the behavior of either sport fish stocks or marine mammals. Fish stocks could potentially be affected if the cages act as fish aggregating devices (FADs), but there are already very many such FADs in use around the Hawaiian Islands, including off the Big Island of Hawaii, and they are not considered deleterious to the species which aggregating around them now. It is possible the intended fish cages might increase the contact of wild and aquacultured fish, but the location of the intended site at Malae is not in an area where wild ahi tuna normally travel.

The cages are designed to be resistant to potentially curious dolphins or whales, and to minimize any impact on such protected species. Interaction with these species is likely to be limited to an initial curiosity when encounters occur at all, and no deleterious effects on these protected species or sea turtles are likely in my opinion. I have worked with colleagues very diligently to improve the types of lines used in crab and lobster pots on the east coast (c.f. Michael Moore, of the Woods Hole Oceanographic Institute), and for the mooring lines of these cages similar types of lines approaches will be used: lines with colors readily visible to marine mammals, and impregnated with acoustically reflecting material. As with other aspects of this project, monitoring of interactions with marine mammals will be necessary, but the extent of these interactions is very unlikely to be significant in any way.

Finally, the concern about whether these cages will attract sharks and/or affect their behavior is one which simply cannot be unequivocally answered in advance, and will require monitoring. However there is no good reason to suppose that these cages will attract the interest of sharks at this time, again in large part due to the intended location of the cages.

One further comment is worth mentioning. I have worked closely with many who are very concerned about the over-harvesting of ocean fisheries, and who are promoting consumption of more sustainably harvested fish. There is a problem in that the projected increase in the worlds' population will continue to depend very significantly on ocean fish as a protein source. There needs to be some effort to develop a method of aquaculture of marine fish which can reduce the over-fishing of the worlds' oceans, and be done sustainably. A large grant has just been issued by California Sea Grant (see "Sea Technology" March 2009, p.56) to reduce the amount of fishmeal used in finfish diets in aquaculture and replace it with plant-based supplements, including enzymes to facilitate digestion. This has already been done with Atlantic cultured salmon, reducing fishmeal by 75-80%. This should also be possible with ahi cultured in Hawaii, thereby reducing use of baitfish in feeds. Baitfish will be harvested worldwide for various uses, but this project will contribute to more efficient use of these limited resources by making use of state of the art advances in food materials for the fish cultured. This point is worth making as this is often cited as a reason that marine aquaculture efforts should not be permitted. Baitfish harvests will persist in most countries for other reasons in any case, but by using advanced diets for fish, this project will be a global leader in reducing demand for these resources.

In closing, I believe that moving into the future there have to be some choice made about fish production and harvesting. We cannot persist with practices used in the past, particularly as the rate of illegal fishing has been rapidly increasing in recent years, including in marine protected areas where law enforcement has been less than adequate. New alternative approaches to fisheries are required now and into the future. The methods proposed here include as many safeguards as can reasonably be expected given known problems, and sufficient monitoring protocols by third parties to ensure that if problems arise they will be publicly known, and can be addressed. No project can be said to be 100% certain to be free of all potential problems in advance. This project is one of many aquaculture projects I have reviewed in the past 20 years, and I believe that it has done sufficient due diligence in site selection, and management and monitoring practices proposed to minimize risks to the marine environment, cultural resources, protected species, and human users of adjacent marine areas. I believe the project should be permitted so that Hawaii can continue to claim its' due status as a world leader in sustainable and well managed fisheries, to which this project will contribute.

Dr. Phil McGillivray, Oceanographer
PO Box 5082, Alameda, Ca. 94501-8582
PH 510-469-5056 / FAX 510-437-2961 /Email: Philip.a.mcgillivray@uscg.mil
A copy of my vitae is appended.

DR. PHILIP A. MCGILLIVARY

P.O. Box 5082

Alameda, Ca. 94501-8582

PH W: 510-437-5355/CELL 469-5056

Email: Philip.a.mcgillivary@uscg.mil

EDUCATION

- 1988 Ph.D., Ecology, Institute of Ecology and Skidaway Institute of Oceanography,
University of Georgia, Athens, Ga.
Dissertation: "Zooplankton Community Structure & Biogeochemical
Cycling at Gulf Stream Fronts off the Southeastern United States".
Dissertation Chair: Larry Pomeroy;
Dissertation Advisor: Roger B. Hanson
- 1976-78 Graduate Courses, Oceanography, University of Miami, Rosenstiel School
- 1975 B.S., Biology and Chemistry Double Major, Dickinson College, Carlisle, Pa.

PERSONAL BACKGROUND

Since 1996, Science Liaison for USCG Icebreaker Operations, in charge of science outreach and logistics for all types of science from pole to pole. Liaison responsibilities with scientists and funding agencies, including the National Science Foundation, US Navy, NOAA, NASA, National Park Service, Minerals Management Service, US Fish & Wildlife Service, and other US and international agencies conducting research at high latitudes. Additionally responsible for interfacing with native peoples of the arctic.

Previously several years in Office of Secretary of Defense working on advanced computer systems and Internet implementation strategies, including electronic commerce.

Earlier, spent two years with Hawaiian natives preserving traditional maritime ecosystem management knowledge, including authorship of NOAA planning White Paper for establishment of the Hawaii National Marine Sanctuary, environmental consulting to preserve coastal areas, and advisor to marine aquarium trade organization. Prior post-doctoral work with NOAA Monterey Center for Ocean Analysis & Prediction at Naval Fleet Numerical Oceanography Center on large environmental database systems for climate prediction, and development and deployment of advanced remote sensing technologies through joint appointment with NOAA Environmental Research Labs (former) Wave Propagation Lab (now Environmental Technologies Lab) in Boulder, Co..

Initial post-doctoral experience under Office of Naval Research funding at UC Santa Barbara Marine Science Institute studying global particulate carbon flux issues. Early career work as member of NOAA Atlantic Oceanic & Meteorological Labs' Marine Geology and Geophysics Lab; founding member of NOAA Ocean Chemistry Lab.

PROFESSIONAL INTERESTS

Application of new technologies, including satellites, lasers, radars, acoustics and autonomous underwater vehicles to improve data collection for marine ecosystems management. Educational outreach to schools, universities, general public and legislators on marine management issues.

VITAE
DR. PHIL MCGILLIVARY

EXPERIENCE

- 1996-present Science Liaison, US Coast Guard Icebreaker Operations, Alameda, Ca.
- 1994-1996 Office of Secretary of Defense, Computer and Internet Security Consultant
- 1992-1993 Marine and Environmental Consultant, O'ahu, Hawaii
- 1989-1992 Research Associate, University of Colorado, Boulder jointly with Fleet Naval Oceanographic Center, Monterey, Ca., and NOAA Center for Ocean Analysis and Prediction, Monterey, Ca.
- 1986-1988 Research Associate, Marine Science Institute, University of Santa Barbara, California; Sponsor: Office Naval Research
- 1985 Oceanographer, National Oceanic & Atmospheric Administration, Miami
- 1979-1983 Graduate Research and Teaching positions, University of Georgia
- 1976-79 Chemist, National Oceanic and Atmospheric Administration, Miami

AWARDS

- Civilian Employee of the Quarter, US Coast Guard, Pacific Area
- Distinguished Authorship Award, US Dept. Commerce
- Best Publication of Year, National Oceanic and Atmospheric Administration
- Best Graduate Student Paper in Zoology, University of Georgia

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Geophysical Union (AGU)
- The Oceanography Society (TOS)
- Marine Technology Society (MTS)
- International Society for Optical Engineers (SPIE)
- World Aquaculture Society

TEACHING EXPERIENCE

- Graduate: Chemical & Physical Oceanography, Microbial Ecology
- Undergraduate: Biology I and II (Introductory Biology)

RESEARCH CRUISE EXPERIENCE

Over two years at sea on 32 cruises on UNOLS, NOAA and USCG vessels funded by National Science Foundation, National Oceanic and Atmospheric Administration, and Office of Naval Research. Experience includes work on "Johnson Sea Link" and "Delta-2" Submersibles.

ONLINE COLLABORATIVE RESEARCH

Gulf of Alaska Release of SOLO Vertical Profiling Buoy: (coordinated with Jim Bishop, Lawrence Berkeley Labs)

http://www.lbl.gov/Publications/Currents/archive/#_Hlk512396296

Antarctica's Giant Ross Sea Iceberg: (coordinated with Doug MacAyeal, Univ. Chicago)
<http://www.nsf.gov/od/lpa/news/media/01/ma0104.htm>

American Samoa's New Underwater Volcano (in G-cubed: Geochemistry, Geophysics and Geosystems, AGU's online journal), coordinated with Stan Hart, WHOI, and Hubert Staudigel, SIO: >URL <http://www.g-cubed.org> or <<http://www-pacer.ucsd.edu/Avon23/hartetel.htm>

NASA Arctic Telepresent Underwater ROV Stereo Video Imaging & Educational Outreach: (with NASA Ames personnel) <http://quest.arc.nasa.gov/arctic>

Computer Security for DoD

http://www2.dcnicn.com/cals/cals_ide/task07/pdf/security/security.pdf

TELEVISION SPECIALS

2002 Discovery Channel, "Under Antarctic Ice" First Discovery Channel HDTV Special

1999 Discovery Channel, "NASA Explores Under the Ice"

1992 'Olelo, Hawaii PBS Series "The Young & the Old," Two Broadcast Specials:
"La'au Lapa'au: Traditional Hawaiian Healers,"
with Michael Keanuenu Goodrich
(Winner Hawaii PBS Best Program of Year Award, 1992)

SELECTED PUBLICATIONS, PRESENTATIONS

Presentations (Invited, 2006 only)

2006 "Technology Needs for Autonomous Underwater Samplers," NOAA NURP West Coast & Polar Regions Conference on AUVs, May 25, MBARI, Ca.

"Robo-kayaks, Improved Wireless Communications, and PICOSAT Systems for Ocean Remote Sensing: Applications in the Ross Sea, Antarctica for International Polar Year Studies." Polar Technologies Conference, April 13, NASA Ames, Moffett Field, Ca.

"Autonomous Surface Vessels for Air-Sea Flux and Satellite Calibration / Validation Studies," Global Ocean Surface Underway Data & Shipboard Automated Meteorological and Oceanographic Data Systems (GOSUD/SAMOS) Workshop, May 16, UCAR, Boulder, Co.

Autonomous Vessels for International Polar Year Studies in the Ross Sea, Antarctica. P.A. McGillivray, G. D'Spain, T. Boyd, D. Doolittle, S. Vogel, and H-W. Schenke. (Poster) Ocean Sciences Meeting, Honolulu, Hi., Feb. 20-24.

Publications

2007 Wireless Communications Advances for Maritime Use: Applications of New Protocols for Delay and Disruption-Tolerant Networking. P. McGillivray, K. Fall and A. Maffei. *Sea Technology* 48(5):10-14.

Wave-Powered Autonomous Surface Vessels as Components of Ocean Observing Systems. P. McGillivray and R. Hine. PACON 2007, June 24-27, Honolulu, Hi. Accepted, In Press.

Environmental Best Practices Management for Offshore Cage Aquaculture of Marine Finfish. P. McGillivray, P. Troy and B. Spencer. PACON 2007, June 24-27, Honolulu, Hi. Accepted, In press.

Long-Term, Long-Range Bathymetric Mapping in the Southern Ocean From Wave-Powered Autonomous Surface Vessels. P. McGillivray, R. Hine, R. Anderson, M. Rognstad. *Procs. Intl. Symp. Antarctic Earth Sciences*, Santa Barbara, Ca., Aug.26-Sept.1. Accepted, In press.

Googling the Oceans: Methods for Multimedia Maritime Geospatial Data Display. P. McGillivray, L. Taylor, J. Racanelli, K. Schwehr & D. Staudigel. *Procs. Oceans07 MTS/IEEE*, Oct. 2-4, Vancouver. Accepted, In press.

Marine Automatic Identification System (AIS) Data Analysis for Enhanced Coastal Security: An Oil Spill Tracking Application. P. McGillivray and K. Schwehr. *Procs. Oceans07 MTS/IEEE*, Oct.2-4, Vancouver. Accepted, In press.

Publications / Presentations (continued)

- 2007 Capabilities and Uses for a New Type of Wave Powered Autonomous Surface Vessel. R. Hine and P. McGillivray. Procs. Occans07 MTS/IEEE, Oct.2-4, Vancouver. Accepted, In press.
- 2006 Self-positioning Smart Buoys, The "Un-Buoy" Solution: Logistic Considerations Using Autonomous Surface Craft Technology and Improved Communications Infrastructure. J.A. Curcio, P.A. McGillivray, K. Fall, A. Maffei, K. Schwehr, R. Twigg, C. Kitts, P. Ballou. Procs. Conf. Marine Technology Society, Boston, Mass., Sept. 18-22.
- 2005 AUVs for ANSWRS: Antarctic Studies in the Western Ross Sea, Antarctica
P. McGillivray, G. D'Spain, T. Boyd, E. Sauter, H-W. Schenke, S. Vogel,
D.Doolittle, Procs. Conf. Marine Technology Society, Wash., DC., Sept. 19-23.
- Recovering the Lost Treasures of Ipiutak (Pt. Hope), Alaska. Procs. Conf. Marine Technology Society, Wash., DC, Sept. 19-23.
- 2004 Need for automated meteorological and oceanographic observations from research & support vessels operating in the Polar Oceans. Shawn R. Smith (Florida State University, Tallahassee) and P. McGillivray (USCG). INMARTEC 2004, British Antarctic Survey, Cambridge, UK, September 20-23.
- 2004 Current and projected bathymetric data sources for the Ross Sea, Antarctica, for the IBCSO from USCG Icebreakers and Autonomous Underwater Vehicles. Caress, D., Kirkwood, W., Thomas, H., Sibenac, M., (Monterey Bay Aquarium Research Inst.) and McGillivray, P.(USCG), XXVIII Science Committee Antarctic Research Conf., Bremen
- 2003 Marine Meteorological Measurements from the USCG Polar Class Icebreakers. High Resolution Marine Meteorology Workshop, Tallahassee, Fla., March 3-5.
- 1999 Uses, Calibration & Error Estimation Techniques for Integrated Optical and Acoustic Underwater Vehicle 3D Measurement Systems, A.C. Derbes, T. Blackmon & P. McGillivray, Abstract, AGU, June, 1999.
- 1998 High Latitude Research: NASA, NOAA, USCG Test ROV Technology. P. McGillivray, et. al., Underwater Magazine, Fall, 1998, pp.43-45.
- Response Actions at Offshore Hazardous Waste Sites. J. Lindsay, H. Karl, P. McGillivray, P. Vogt, I. McDonald & B. Coles. IEEE Procs. Oceans '98, 5pp.
- Real-Time Educational Outreach from A Coast Guard Icebreaker in the Arctic. M. Leon, P. McGillivray and Seth Carter, Abstract and Video Poster, American Geophysical Union, Dec., 1998, San Francisco, Ca.

Publications / Presentations (continued)

1994-96 Various Department of Defense internal publications on computer issues.

1994 Commercial Fisheries Conflicts in the Bering Sea and Adjacent Northern Pacific Ocean. N. Mirovitskaya, Y. Kaoru, K. Gjerde, P. McGillivray & J.C. Haney. 30pp., Environmental Security & the World's Oceans, eds. J. Broadus & R. Vartanov. Island Press, Boston.

1992 Coastal ocean effects from desalination: legislative synthesis, data needs and management options. P. McGillivray, J. Rote & J.C. Haney. Abstract, American Geophysical Union, Jan. 1992.

1991 Attachment probabilities of marine snow and their implications for particle coagulation in the ocean. A. Alldredge and P. McGillivray. Deep-Sea Res. 38(4):431-443.

Optical properties of several Pacific fishes. J.H. Churnside and P. McGillivray. Applied Optics, 30(21):2925-2927.

NOAA's Coastal Ocean Database and FOCOS Program. D.R. McLain and P. McGillivray. Pp.3418-3432 in: Coastal Zone '91, Procs. Seventh Symp. on Coastal and Ocean Management, eds. O. Magoon and V. Tippie.

1991 Data availability & management for global coral reef & climate dynamics studies. P. McGillivray, M. Johnson & D. White. Abstract, Intl. Soc. Reef Studies, Berkeley, Ca., Dec. 13-16.

Scanning ship and airborne lasers for coral reef monitoring: status and potential. P. McGillivray, J.T. Hardy, F. Hoge, R. Gauldie, S. Sharma, and P. Dustan. Abstract, International Society for Reef Studies, Berkeley, Ca., Dec. 13-16.

Applications of new technology in ocean sciences in the Pacific. Pacific Science Congress, Honolulu, Hi. June, 1991.

Pacific aquaculture in the '90's: new technology and species. Pacific Science Congress, Honolulu, Hi., June, 1991.

NOAA remote sensing technology & databases applicable to reef monitoring. Workshop on Kaneohe Bay Management Plan, May 1,2, Coconut Island.

1990 Mapping of ocean surface currents. Descriptions & uses in coastal oceanography. Pp. 309-320 in: Coastal Ocean Prediction Systems, Procs. Planning Workshop, Vol.2, Overview and Invited Papers, ed. C. Mooers, March 16, 1990.

Publications / Presentations (continued)

- 1990 New radar methods for providing ocean wind, current, and soliton data for scientists & managers. Abstract, American Geophysical Union, Dec. 1990.
- 1989 Trace metal fluxes along Gulf Stream frontal boundaries off the southeastern U.S.. Abstract, American Geophysical Union, Dec. 1989.
- Observations and analysis of shelf-edge surface solitons off the southeastern U.S.. Abstract, American Geophysical Union, Dec. 1989. (Invited)
- Preliminary ecologic data on coastal stomatopods (Crustacea: Stomatopoda) on Molokai, Hawaii. Abstract, American Geophysical Union, Dec. 1989.
- 1987 Mechanisms of marine snow production: attachment probabilities of natural particles on collision. P. McGillivary and A. Alldredge. Abstract, American Society Limnology & Oceanography, Jan. 1988 (Invited)
- Oceanic and atmospheric forcing: implications for particle entrainment in the Santa Barbara Channel. Abstract, American Society of Limnology and Oceanography, Dec. 1988. (Invited)
- 1987 Ecology of Salps (Thalicea: Salpidae) in Gulf Stream & outer continental shelf waters off the southeastern U.S.. Abstract, American Society for Limnology & Oceanography, Dec. 1988.
- 1987 Real-time characterization of bioluminescent plankton communities across a coastal front. E.A. Widder, S.A. Bernstein, P.A. McGillivary, and J. Case. Abstract, American Society of Limnology and Oceanography, Dec. 1988.
- 1986 Gulf Stream topographic mixing over the Blake Plateau: physical and biological effects. P.A. McGillivary, L.R. Pomeroy, R.B. Hanson, A.M. Wood, E.R. Peele, B. Sherr, & E. Sherr. Abstract, American Geophysical Union, Spring, 1986.
- Particle aggregation kinetics and ocean energetics of Gulf Stream frontal boundaries. *Aggregate Dynamics in the Sea*. Report Office Naval Research Workshop, Pacific Grove, Ca., Sept.22-24.
- Mid-shelf fronts in the South Atlantic Bight and their influence on seabird distribution and seasonal abundance. J.C. Haney and P.A. McGillivary. *Biological Oceanography*, 3(4):401-430.
[*Best Graduate Paper in Zoology, University of Georgia, 1984*]

Publications / Presentations (continued)

- 1986 Aggregations of Cory's Shearwater (*Calonectris diomedea*) at Gulf Stream fronts.
J.C. Hancy and P.A. McGilivary. *Wilson Bull.* 197:191-200.
- 1985 Biological consequences of Gulf Stream topographic turbulence over the Inner
Blake Plateau. L.R. Pomeroy, P.A. McGilivary, R.B. Hanson, A.M. Wood,
E. Peele, J. Krewer, B. and E. Sherr.
Abstract, American Society of Limnology & Oceanography, Summer, 1985.
- 1984 Microbiology and chemistry of fecal products of pelagic tunicates: rates and fates.
L.R. Pomeroy, R.B. Hanson, P. McGilivary, B. Sherr, D. Kirchman, & D. Deibel.
Proceedings Second Symposium on Detritus in the Aquatic Environment.
Bull Mar. Sci. 35:426-439.
- Insect dispersal and inputs into a subtropical marine environment.
A.C. Messer and P. McGilivary.
Proceedings, 17th International Congress of Entomology, Hamburg, Germany.
- 1979 Observation of a subsurface oil-rich layer in the open ocean.
G.R. Harvey, A. Requejo, P. McGilivary, and J. Tokar. *Science*, 205:999-1001.
- Polychlorinated biphenyls and chlorinated pesticides in soils of Everglades
National Park and adjacent agricultural areas.
A.G. Requejo, R.H. West, P. Hatcher, and P. McGilivary.
Env. Sci. & Technol. 13(8):931-936.
- 1978 Sewage contamination in the New York Bight. Coprostanol as an indicator.
P. Hatcher and P. McGilivary. *Env. Sci. & Technol.* 13(10):1125-1129.
[*Best Paper of Year, NOAA Environmental Research Labs, and
Distinguished Authorship Award, US Dept. of Commerce*]
- Chemical and physical processes in a dispersing sewage sludge plume.
P. Hatcher, G. Berberian, A. Cantillo, P. McGilivary, P. Hanson & R. West.
Pp.347-378 in: *Ocean Dumping of Industrial Wastes*,
eds. B.H. Ketchum & K. Park. Plenum Press, N.Y..
- 1977 Steroids as sewage specific indicators in New York Bight sediments.
P.G. Hatcher, L. Keister and P. McGilivary,
Bull. Env. Contam. & Toxicol. 17(4):491-498.

May 19, 2009

Dr. Phil McGillivray, Oceanographer
PO Box 5082
Alameda, CA 94501-8582

Dear Dr. McGillivray,

Thank you so much for your thoughtful letter of support of the Kohala Coast Ahi Aquaculture Project being undertaken by my company, Hawaii Oceanic Technology, Inc. As a member of our advisory board since the company was founded in 2006, we recognize that you have a keen understanding of the challenges and opportunities we face. We also appreciate your depth of understanding of the problem we are trying to solve, first and foremost of which is the U.S. dependence on foreign sources of seafood, much of which is grown in less than optimal conditions.

We have appreciated your advice and scientifically founded suggestions of how to address disease problems, contamination, parasitological and monitoring issues. We are glad to have the experience you offer in developing best practices for an operation such as ours and have been honored to collaborate with you on the paper, "Environmental Best Practices Management for Offshore Cage Aquaculture of Marine Finfish," PACON 2007, June 24-27, Honolulu, HI.

It is gratifying to know that you support the deep water operation of our cage technology and agree that our site will not significantly change or affect the behavior of sport fish stocks or marine mammals. Other open ocean aquaculture systems in Hawaii in near shore waters concur with your conclusion that curious turtle, dolphin or whale interactions are likely to be limited to initial curiosity if they occur at all.

Finally, we agree that there is little choice but to develop of method of aquaculture of marine fish which can address the growing global needs for seafood protein and reduce the over-fishing of the worlds' oceans. Aquaculture is the future solution to this problem and with the support and advice of scientists such as you; we hope to be at the forefront of solving this important problem. Thank you for your kind assistance.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Ste. 2902
Honolulu, HI 96813



55 Holomua Street ~ Hilo Hawaii 96720
Phone (808) 961-0877 ~ Fax (808) 934-8783 / (808) 935-1603

April 8, 2009

Dawn Hegger
Office of Conservation and Coastal Lands
Hawaii Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR - 9 A 7:48
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

RE: Hawaii Oceanic Technology, Inc.

Dear Ms. Hegger:

We are in support of Hawaii Oceanic Technology, Inc.'s proposal to grow Ahi in Hawaii. With the declining worldwide supply of wild fish, these efforts will help to reduce the fishing pressure on the wild stock in the ocean, which keeps decreasing due to increased demand from consumers who are becoming more aware of the health benefits that fish has to offer.

The ocean resources in Hawaii are mostly used for commercial and sport fishing, transportation and tourism. As much as we utilize the land in Hawaii for farming we should be allowed to utilize the ocean for farming as well, so long as we do it in an environmentally friendly way, as is the intent of Hawaii Oceanic Technology, Inc.

This proposal will also help to positively contribute to the economy in Hawaii by providing many jobs. Also, there has been a lot of talk and literature concerning sustainability in Hawaii and this proposal will help Hawaii become more self sufficient. Should you have any questions or concerns please do not hesitate to call us at (808) 961-0877.

Respectfully submitted,

Gregg Hirata
Chief Financial Officer
Hilo Fish Company
65 Holomua St.
Hilo, HI 96720

May 22, 2009

Greg Hirata
Chief Financial Officer
Hilo fish Company
65 Holomua St.
Hilo, HI 96720

Thank you so much for your letter of support for the Ahi Aquaculture Project. We agree that the declining supply of wild stock will keep increasing due to the insatiable consumer demand.

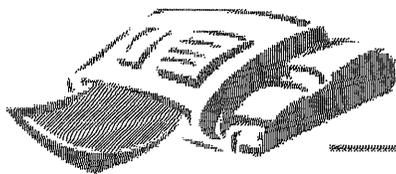
As you say, this form of agriculture can be done in an environmentally friendly way and will positively contribute to the economy in Hawaii by providing many direct and indirect jobs. Economic sustainability is our primary goal and we are convinced that the size of our operation is key to achieving this goal.

We appreciate your support and look forward to working with you in the future.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813



faxZERO

Send a fax for free

Recipient Information

To: Dawn Hagger
Fax #: 8085870322

Sender Information

From: Richard Liebmann
Email address: liebmann@wave.bicv.net
Sent on: Monday, April 6 2009 at 9:08 PM CDT

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR -7 A 8:02
DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

This fax was sent using the FaxZero.com free fax service. FaxZero.com has a zero tolerance policy for abuse and junk faxes. If this fax is spam or abusive, please e-mail support@faxzero.com or send a fax to 800-980-6858. Specify fax #1762553. We will add your fax number to the block list.

April 6, 2009

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2009 APR -7 A 8:01

To Applicant: Bill Spencer, CEO
Hawaii Oceanic Technology
Fax 808 528 4751

To Approving Agency: Dawn Hagger
Department of Land and Natural Resources
Fax 808 587 0322

To Consultant: George Redpath
Tetrattech
Fax 808 533 3306

To OEQC: Fax 808 586 4186

From: Dr. Richard Liebmann
PO Box 32 Hawi, Hi 06719

Re: Comment on Draft Environmental Statement

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Aloha Friends,

Please accept this fax as my official comment to the Draft Environmental Impact Statement for Hawaii Oceanic Technologies application to the Hawaii Department of Land and Natural Resources for permitting of their proposed Ahi Aquaculture in the North Kohala coastal waters.

I have lived on the big island since 1979 and for the past 6 years have lived in Hawi. I am presently applying for a position on the North Kohala Community Development Plan Action Committee.

I am very concerned that the North Kohala Community has not been given adequate opportunity to learn about this project that may impact North Kohala in significant ways. I understand that technically the permitting process is by state agencies rather than the County of Hawaii. Nonetheless, if this project has any negative impact to the local coastal waters and shore it will impact the residents of North Kohala. For this reason I am requesting Hawaii Oceanic Technology make a commitment to inform the residents of North Kohala on the details of their proposed project. I furthermore request that this project be assessed by the North Kohala Community Development Plan Action Committee.

This project has many unanswered issues regarding local socioeconomic impact, impact on local fisherpeople and fish populations, impact on local cultural practices and resources, and potential conflicts with marine mammals and endangered species. Additionally, the Oceansphere technology being proposed is new and unproven and contingencies need to be in place to deal effectively with unforeseen

events (like the 7.0 magnitude earthquake in October of 2006).

The residents of North Kohala are becoming increasingly concerned about issues of sustainability as it relates to food. We hope that all commercial ventures that come to North Kohala and plan to utilize the commons (in this case the coastal ocean waters) contribute in a positive way to the well being of the North Kohala community.

Thank you for allowing citizens to voice our concerns. I look forward to your response.

Please confirm receipt of this fax by email to email address below.

Aloha,

A handwritten signature in cursive script that reads "Richard Liebmann". The signature is written in dark ink and is positioned above the typed name and email address.

Dr. Richard Liebmann ND
liebmann@wave.bicv.net

May 22, 2009

Dr. Richard Liebmann
PO Box 32
Hawaii, HI 06719

Dear Dr. Liebmann,

Thank you for your thoughtful comments on our Draft Environmental Impact Statement pertaining to the Hawaii Oceanic Technology Ahi Aquaculture project.

The company has undertaken a number of public meetings with members of the community that were well publicized, including the two well attended meetings of the Kawaihae Local Resource Council meeting, and follow up meetings with many individuals and group representatives in the Kawaihae area and ocean related user community. Our last public hearing held at the Macadamia Nut Factory in Kawaihae had three statutory notices in the newspaper plus a news story that identified where the meeting would be held and at what time. We have published a list of meetings that were held with the community on page 4-4 of the Final Environmental Impact Statement. We also plan to have public meetings going forward so as to inform as many people as possible. We welcome the opportunity to meet with the North Kohala Community Development Plan Action Committee.

Regarding economic impacts Standard socioeconomic analytical tools were used to determine impacts. As described in Section 2.9.2 of the EIS, Section on "Factors Considered for Impacts Analysis" the "Factors 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 Hawaii 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; and
- Result in risks on the health and safety of children. (DEIS p. 2-93)

Table 2.9-4 (DEIS p. 2-93) summarizes impacts on socioeconomics. Alternative 1 and Alternative 2 would have beneficial effects on the local economy, with increases in employment, income, and business sales volume from the Ahi Aquaculture Project. Environmental Justice will be impacted positively by the availability of jobs at all educational levels. In addition to full time employees the company also expects to contract for a variety of services that will provide additional employment.

Public comment letters on the DEIS include letters from those who strongly believe that this business will provide needed economic development for the state's economy. Numerous individuals who work in the maritime industry or fishing industry or know

people who work in the industry testified that this project would provide much needed employment in the maritime industry (Please see DEIS public comment letters from Wilson, Kopra, Wilson, Daw, Jardine, Kramer, Hirata, Malan, Kraul, Fulmer and others in the appendix of the Final EIS for details.)

Regarding your comment about the Oceansphere technology being new and unproven, please note that most of our technology for telemetry and geostatic positioning has been in use in the US Navy, shipping and in the oil drilling industry for many years. Our approach is to apply this technology to fish farming. We will be going through a rigorous course of testing from beta to final version before deploying the full farm capacity so as to deal with unforeseen situations. Since we are located in 1320 feet of water, the effects of earthquakes and tsunamis have been deemed to be negligible by our esteemed board of advisors and research contributors to the project.

We are devoted to environmental responsibility and economic stability and intend to contribute to the community with meaningful jobs, reliance on local contractors, and of course generating tax revenues that will contribute to the economic stability of Hawaii.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', written over a horizontal line.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

64276

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Mr. Spencer, ,

2009 APR -9 A 10:49

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental
Quality Control

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Aloha Decisionmakers,

Hawaii Farmers Union is the newest chapter of National Farmers Union - the oldest general farming organization representing nearly 300,000 members. For 107 years, NFU has advocate for family farmers , ranchers and fishers through education, legislation and cooperation. Since our HFU charter meeting in November, we have a growing membership on 4 islands.

Concerning the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast, HFU has many concerns. These concerns are supported by our 2009 NFU Policy excerpted here;

(exerpted from)--Policy of the National Farmers Union
Enacted by delegates to the 107th anniversary convention
Washington, D.C.
March 8-10, 2009

(available online from www.hawaiifarmersunion.org and www.nfu.org)

from p. 55

D. Sustainable Working Waterfronts

Access and conservative harvest practices are essential to fishery dependent coastal

communities and active working waterfronts. NFU supports:

- 1) Promotion of sustainable, local seafood production;
- 2) Equitable access for community-based fishing fleets;
- 3) Competitive markets; and
- 4) Safeguarding opportunities for future generations of independent fishing families.

from p. 107

Z. Marine Aquaculture (new in 2009)

The development of industrial-scale offshore finfish aquaculture is detrimental to the

family fishers and local economies of historic fishing communities. It should not be

allowed to proceed unless and until there is national legislation in place that ensures it

can be conducted without harming marine ecosystems and coastal fishing communities.

We oppose:

- 1) Promotion of offshore aquaculture operations that displace or endanger traditional fishing practices and onshore infrastructure;
- 2) Inefficient use of marine resources as feed within such operations;
- 3) Federal subsidies to promote, sustain or further develop such operations; and
- 4) Marine fishing operations that are not community-based and do not contribute to the promotion of locally and sustainably caught wild seafood.

In addition to being an environmentally and economically unsustainable enterprise, HOTI has not established that this type of aquaculture will contribute in any significant way (if at all) to Hawai'i's food security - a consideration with which to measure all publicly supported projects in these times.

Hawaii Farmers Union looks forward to working with lawmakers to develop policy and legislation that DOES promote our food security throughout the islands. Such initiatives will include utilizing the exemplary models of traditional agriculture and aquaculture which was brought to such expert levels by pre-contact Hawaiians.

Today we need to look at the big picture rather than court "venture capitalists" - as Kona Blue's Neil Sims suggested in his presentation to the Kawaihae Resources public meeting on April 5 - to direct Hawai'i's food security future. Let's provide the best options to Hawai'i's people and then support each other in implementing them.

In conclusion the HOTI DEIS is woefully inadequate and this proposal should not be considered without extensive educational outreach and public hearings.

Sincerely,

Eden M. Peart
Hawaii Farmers Union

Eden Marie Peart
P.O. Box 1863
Honokaa, HI 96727

**Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813**

Eden M. Peart
Hawaii Farmers Union
P.O. Box 1863
Honokaa, HI 96727

Aloha,

Thank you for your email of April 9, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. In your letter, you provide a series of comments and policy statements from the National Farmers Union. We appreciate receiving this information.

In addition to the policy statements, you provide some specific comments on our project. This letter will provide a response to these project specific comments. Your comment is presented first in bold face font, then our response.

In your letter, you state, “In addition to being an environmentally and economically unsustainable enterprise, HOTI has not established that this type of aquaculture will contribute in any significant way (if at all) to Hawaii’s food security – a consideration with which to measure all publicly supported projects in these times.”

Environmental Sustainability:

We understand your concerns about the past experiences of some forms of open ocean aquaculture, such as some of the past salmon farming off the Pacific Northwest coast. The design of this project learns from the lessons of these other operations. The unique design enables the Oceanspheres to be located in very deep water without any anchors. The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters, which provides the water circulation necessary to keep a healthy environment for the production facility and surrounding marine environment.

As described in the DEIS Section 2.4 (p. 2-40) on Water Quality, “Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes’ metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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

Regarding any potential impact on fisheries, as analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko’a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie “Lala” La’au and Robert Cambra. Both

fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko‘a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

In the section 2.11 of the EIS on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as ‘opelu ko‘a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and ‘opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘opelu, but that it would not have a permanent affect on the ‘opelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono. (DEIS, p. 2-128)

Economic Sustainability:

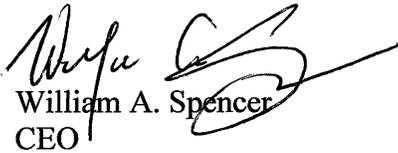
Hawaii Oceanic Technology has studied the experience of other aquaculture operations, learning about the challenges and solutions they devised. The lessons learned by these other company's informed the technology design of the Oceanspheres as an untethered self-powered submerged open ocean aquaculture platform. As noted in the DLNR Division of Aquatic Resources comment letter on the DEIS, “there are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world.” (see the letter in the appendix to the FEIS). Based on these new designs, Hawaii Oceanic Technology is confident that its business model will be a success.

Food Security:

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the state in terms of taxable export revenues, the company’s employees and investors which are primarily based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company does not want to hurt local fisherman who also catch high value tuna this is sold locally but also exported to Japan and the mainland. Hawaii only consumes 3,000 tons annually of tuna of which 80% is imported. From a sustainability stand point the company would be happy to provide tuna to the local market to reduce imports so long as it does not have a negative impact on local fishermen.

Thank you for your comprehensive comments on the DEIS.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a large, stylized flourish at the end.

William A. Spencer
CEO

Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

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Department of Land and Natural Resources
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AND COASTAL LANDS
2009 APR 14 A 9:20
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Subject: Comments on Proposed Ahi Aquaculture Project (DEIS)

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. (HOTI) has submitted.

It doesn't adequately cover a variety of obvious concerns:

1. How much waste will be created and how will it affect the marine environment?
2. Can the cages withstand major storms and what happens if one wanders away from the farm site, since the cages are not tied down and are only one mile from a humpback whale sanctuary?
3. The cages use a new technology to generate their own energy to remain in one place by sucking up sea water from below - how will this affect benthic and pelagic organisms? What cultural impacts will it have?

I know very little about this experiment and about how the fish pens - called Oceanspheres - will affect marine wildlife. I do know that similar fish farm projects worldwide have caused problems for habitat, wild fish, water quality, and the economies of coastal communities.

While the proposed lease site is three times the size of any existing ocean fish farming operation in Hawaii and aims to produce forty-eight times more fish than another local farm it claims to be similar to; perhaps HOTI should scale back the project.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address the issues I have stated above before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

It is interesting that HOTI sent their representative to the Kawaihae Local Resource Council meeting on April 5th rather than their principals. Their failure further demonstrates the lack of concern for public outreach on this issue.

Sincerely,



Gwen Haban
76-6182 Alii Drive
Kailua-Kona, HI 96740

**Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813**

Gwen Ilaban
76-6182 Alii Drive
Kailua-Kona, HI 96740

Dear Ms. Ilaban,

Thank you for your letter dated April 14, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. In your letter, you provide a series of comments and some specific questions. This letter will provide a response to each question following the categories in your letter. Your question is presented first in bold face font. Then, in regular font following each question, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. “How much waste will be created and how will it affect the marine environment?”

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that, “Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes’ metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mile) distance from coral reefs and 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.”

The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, “At the site location many of the issues about water quality, bottom impacts and entanglement would be nonexistent.” (Please see UH Environmental Center letter in the appendix).

The ocean current study in the EIS Appendix B concludes on page 11 stating, “The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998).” (Lukas 2008, p. 11).

“Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

“Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton).”(Lukas 2008, p. 11).

2. “Can the cages withstand major storms and what happens if one wanders away from the farm site, since the cages are not tied down and are only one mile from a humpback whale sanctuary?”

The FEIS Chapter 1.0 describes the power system on p. 1-15 as follows: “The Oceansphere is a very good example of a hybrid vehicle. The Oceansphere will run a Stirling engine, wave power generator and biofuel engine to keep a bank of batteries charged. The batteries power electric motors driving the propellers and controls systems....A Fresnel solar concentrator will provide heat and surface seawater will provide a heat sink for the Stirling cycle used to produce electricity to operate the thrusters for the Oceanspheres under average conditions. The up and down vertical motion of wave power is used to assist power generation and a biofuel engine will ensure that the Oceansphere always has enough power to operate 24 hours a day, seven days a week.”

As noted in Section 2.10 on Emergency Services and Human Health and Safety, (p. 2-98 DEIS), it states that “In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology is required to contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be immediately notified. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere however; a salvage company will be called in the event the work crew can't handle the problem.

As noted in the EIS Section 1.4 Description of the Proposed Action (p. 1-12 DEIS), “Free drifting 'subsurface' floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT professor, as per 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. A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area (see Appendix C) 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 hours of failure by the 24/7 dispatch marine salvage company, such as the work boat the “Raven” operating out of Honokohau Harbor.”

3. “ The cages use a new technology to generate their own energy to remain in one place by sucking up sea water from below – how will this affect benthic and pelagic organisms?”

As described in the FEIS, and described above in the response to #2, the technological design has been modified. This has removed the need for a deep seawater pipe. However, to address your concern, the EIS Chapter 2.4 on Water Quality states in Section 2.4.2 on Environmental Impacts that “Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

4. “What cultural impacts will it have?”

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie “Lala” La‘au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko‘a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko‘a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as ‘opelu ko‘a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and ‘opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘opelu, but that it would not have a permanent affect on the ‘opelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono. (DEIS, p. 2-128)

5. “While the proposed lease site is three times the size of any existing ocean fish farming operation in Hawaii and aims to produce forty-eight times more fish than another local farm it claims to be similar to; perhaps HOTI should scale back the project.”

The size of the proposed project is larger than other existing operations. The incremental build out of the full project with the ongoing environmental monitoring program will ensure that environmental quality and public safety is protected.

Thank you for your comprehensive comments on the DEIS.

Sincerely,



William A. Spencer

CEO

Hawaii Oceanic Technology, Inc.

425 South St., Suite 2902

Honolulu, HI 96813

44011

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

As a Native Hawaiian, born and raised in Kohala (Kokoiki and Mahukona, your proposal to create fish farming off Kohala makes me heartsick. I am now a resident of Washington State and live in a coastal fishing town. I have personally seen the effects of salmon fish farming off Canada in the Pacific Northwest and it has caused economic havoc in the commercial (wild) salmon industry, and has ruined the natural beauty of the British Columbia coastline for miles upon miles. The fish pens create a haven for unhealthy bacterial growth and an inferior fish product. I humbly ask you to NOT inflict the pristine Kohala coast with this blight.

Mahalo nui loa,

Reidar Smith
PO Box 1278
Westport, WA 98595

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2009 APR 14 A 9: 20
DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

Reidar Smith
P.O. Box 1278
Westport, WA 98595

Aloha,

Thank you for your letter dated April 14, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project.

We understand your concerns about the past experiences of salmon farming off the Pacific Northwest coast and have learned from this experience and designed our system to avoid these past mistakes. The design of this project enables it to be located in very deep water without any anchors. The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters, which provides the water circulation necessary to keep a healthy environment for the production facility and surrounding marine environment.

As described in the DEIS Section 2.4 (p. 2-40) on Water Quality, "Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes' metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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."

The ocean current study in the EIS Appendix B concludes on page 11 stating,

"The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998)." (Lukas 2008, p. 11).

"Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture." (Lukas 2008, p. 11).

"Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton)." (Lukas 2008, p. 11).

A validation of our technology design was provided by the UH Environmental Center in their comments on the DEIS, saying "At the site location many of the issues about water quality, bottom impacts and entanglement would be nonexistent." The full text of the comment letter is in our FEIS.

We share your concern about protecting the environment and avoiding the problems that were experienced in the past by the salmon farms of the Pacific Northwest. With phased deployment of the Oceanspheres and diligent environmental monitoring, we are committed to protecting the environment and producing healthy seafood.

Thank you for your comprehensive comments on the DEIS.

Sincerely,

A handwritten signature in black ink, appearing to read "William A. Spencer", with a long horizontal flourish extending to the right.

William A. Spencer
CEO

Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

Bill Spencer

From: Bill Spencer [bspencer@hawaii.rr.com]
Sent: Thursday, April 09, 2009 2:58 PM
To: davidtarnas@hawaii.rr.com; 'Paul Troy'
Subject: FW: Ahi aquaculture

fyi

From: Redpath, George [mailto:George.Redpath@tetrattech.com]
Sent: Thursday, April 09, 2009 12:43 PM
To: Bill Spencer
Subject: FW: Ahi aquaculture

Comments from Cory (See Below) – Looks like she read the EA, which I would suspect. Haven't read them all, but looks like they can be answered ok?

George Redpath | Associate Director
Tel: 808.533.3366 | Fax: 808.533.3306 | Cell: 808.371.9179

Tetra Tech Division | Complex World, Clear Solutions
737 Bishop St., Suite 3020 | Honolulu, HI 96813 | www.tetrattech.com

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Please consider the environment before printing this email.

From: Cory (Martha) Harden [mailto:mh@interpac.net]
Sent: Thursday, April 09, 2009 10:56 AM
To: Redpath, George
Subject: Ahi aquaculture

please acknowledge receipt

attachment is identical

COMMENTS ON

AHI AQUACULTURE PROJECT, KOHALA COAST, HAWAII

DRAFT ENVIRONMENTAL IMPACT STATEMENT, DECEMBER 29, 2008

By Ms. Cory Harden, Sierra Club, Moku Loa group, PO Box 1137, Hilo, Hawaii 96721

808-968-8965, mh@interpac.net

SUMMARY

We support sustainable use of ocean resources through ecologically based integration of conservation, wild-caught fishing, and fish farms, with well-informed and reliably funded regulation.

For Hawai'i Island fish farming, we support local production of fish feed, minimizing of impacts on the ocean floor and water quality, and use of most of the fish as food for island residents.

Our concerns about this project include:

There is little research on open-ocean fish farming in Hawai'i, and little independent research nationally. Opinions re. effects on the sea floor should be sought from the few scientists who have studied this subject for offshore fish farms in Hawai'i

Impacts of sucking up sea water to run the propulsion system should be analyzed

The region of influence should be expanded to areas used to provide small fish (in light of overexploitation of many fish) and vegetables for fish feed, and to all areas where jobs may be lost

Farming small fish for feed, instead of shipping in feed, should be evaluated

For all drugs and chemicals that will be used, details of use should be described; effects on farm and wild fish, consumers, and the ocean environment evaluated; and the monitoring system for planned and unplanned use described--including funding sources

Monitoring for disease and parasites should have reliably funded government oversight

Measures to maintain genetic diversity should be described, plus plans for reliably funded monitoring

Measures to prevent escapes of fish, gametes, embryos, and eggs should be described, along with plans for prompt notification of the public if escapes occur

A bond and/or insurance should be required to cover bankruptcy or disaster

More extensive analysis should be done on the effects of tsunamis on self-stabilization

Measures to prevent vandalism and accidental damage should be planned

Shipping one and a third shipping containers of fish feed a day 3000 miles, then flying most of the fish 3000 miles to market, does not appear sustainable

Whether profits will stay in Hawai'i should be clarified

The project may not be economically viable, given that small fish for feed are over-exploited; an increased supply of ahi may lower prices; few offshore fish farms have succeeded without large amounts of government support; and Kona Blue, plus fish farms in New Hampshire and Puerto Rico, are having financial problems

Impacts of privatizing part of the open ocean should be analyzed

Thank you for considering our comments.

SPECIFIC COMMENTS

RESEARCH

Evaluate the validity of research used for this DEIS in light of the following:

“Most of the NMAI [National Marine Aquaculture Initiative]-funded research has been conducted to support and help promote the aquaculture industry and often has been done in collaboration with the industry. There has been minimal independent research, especially on environmental and socioeconomic impacts.” *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 15, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

“Additional research needs to be conducted on the effects, including cumulative and secondary impacts, of aquaculture on the marine environment.” *2007 Woods Hole report, quoted on Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

“OOA is a recent phenomenon...[there is] limited research available to reference...” *DEIS p. 2-39*

ECONOMICS

For any government grants, specify amounts, conditions, expiration dates, and plans for funding after grants expire.

“Hawaii Oceanic Technology’s target market is the US mainland and Japan, where the selling prices would be twice as profitable as the local market.” *DEIS p. 2-93*

Analyze whether this will still be true given future fuel prices, and future lowering of tuna prices when more tuna is available.

HOT will “revitalize Hawai’i’s reputation as a source of high quality, sashimi-grade tuna.” *DEIS*

p. 2-94

Farmed fish are sometimes more flabby than wild fish. Will they still be sashimi-grade?

Compare nutrition levels and fat content of farmed and wild fish and specify how these will be publicized.

How much of the profits will stay in Hawai’i, and how much will go elsewhere?

Evaluate the project’s economic viability in light of the rest of this section--

“Kona Blue Water Farms is not profitable now, according to the document [draft supplemental EA], in part because of the significant costs related to frequently sending divers down to clean the cages and because rough water conditions sometimes prohibit raising the cages and harvesting...” *Kona fish farm in too deep, Hawai’i Tribune-Herald, 3-19-09, p. B 1-2*

[Kona Blue] “...says it must cut production because it’s not making enough money.” *Kona Blue cuts isle production, Hawai’i Tribune-Herald, 3-30-09.*

“...a major challenge is likely to be whether U.S. open ocean aquaculture operations can produce their product at prices competitive with foreign aquaculture.” *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 4, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

“...expanded production of farmed fish could lower prices...”

Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 22, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldberg.pdf+future+seascapes+fishing+fish+farming+goldberg&cd=1&hl=en&ct=clnk&gl=us>

"...high capital start-up costs make estimating profitability and securing financing difficult for new open ocean aquaculture companies." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 3, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"...researchers in Hawaii told us that the development of healthy breeding fish to supply offshore aquaculture operations can often require years of intensive breeding efforts, but that it is difficult to obtain consistent research funding over this long time period." *Offshore Marine Aquaculture, GAO report, May 2008. p. 6.*

"...workers and supplies could have to travel very long distances." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"...the location of the aquaculture facilities away from shore will necessitate high variable costs such as fuel, feed, and security and/or surveillance." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 3, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"...marine aquaculture has proven profitable elsewhere, especially in areas with little or no environmental regulation and/or enforcement [unlike the U.S.]..." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 8, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"Located in Hawaii, New Hampshire, and Puerto Rico...all of these [aquaculture] operations have received government subsidies, making it impossible to demonstrate whether they can survive under true free market conditions." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/introduction>*

"...while the federal government has spent millions of dollars funding offshore aquaculture research and demonstration projects on both U.S. coasts and in Hawaii and Puerto Rico, the commercial viability of the fledgling industry has yet to be proven...."

... 'offshore' or 'open ocean' aquaculture...rarely has been achieved on a small scale and, in most cases, with significant government support....

Randy Cates, president of the Hawaiian aquaculture company Cates International [which operates off O'ahu] , admits that a significant investment of government funds would be needed to subsidize the development of an offshore aquaculture industry in the United States...

From 1998 to 2007, Kona Blue or its parent company, Black Pearls, Inc., received nearly **\$1.8 million** and Cates received about **\$150,000** in grants from the Department of Commerce. The department also granted nearly **\$1.3 million** for collaborative research in support of offshore aquaculture in Hawaii...

Two miles off Culebra, Puerto Rico, Snapperfarm, Inc. raises cobia in collaboration with researchers from the University of Miami and the University of Puerto Rico. The operation produces only 50 tons of fish per year in three cages, but hopes to increase production and acquire permits to add five more cages. However, University of Miami scientist Daniel Benetti admits that 'low survival rates due to disease outbreaks both at the hatchery and at the growout stages are currently causing severe economic impact and compromising the commercial viability of the operations.'...

From 1999-2007, Snapperfarm, Inc. directly received close to **\$60,000** from the Department of Commerce for offshore aquaculture. Researchers also received close to **\$2.3 million** in support of open ocean aquaculture in the Caribbean. Additionally, Congress appropriated more than **\$1.8 million** of USDA funds for general aquaculture research in Florida....

Richard Langan, director of the University of New Hampshire's Atlantic Marine Aquaculture Center, has high hopes for offshore aquaculture. "Certainly the potential is in the many millions of dollars..."¹¹ Langan said...

However, for the years 1997-2006, UNH sold only about 6,500 pounds of fish raised in offshore cages, totaling \$23,711, despite receiving hundreds of thousands of dollars in government subsidies. In 2005 and 2006, the center made 11 sales of cod and 1 sale of cod guts to five Northeastern companies. Despite UNH's statement to NOAA that "halibut, haddock

and cod — all of which have been raised from offshore cages — have excellent potential for commercial development,”¹² the center had not sold any halibut or haddock as of 2006, according to UNH invoices obtained by Food & Water Watch through a public records request. Although UNH’s program is not a commercial operation, these figures indicate that in the 10 years since it was founded, the program has not demonstrated that open ocean aquaculture is commercially viable...

The New Hampshire hatchery, Great Bay Aquaculture, provides UNH and Snapperfarm with juvenile fish for offshore aquaculture. The company also plans to raise cod in cages off the Maine coast. George Nardi, head of Great Bay, echoes Cates’ request for more funding: ‘We need \$50 million, not \$5 million.’ ...

“From 1999 to 2007, Great Bay Aquaculture received nearly **\$250,000** from the Department of Commerce for open ocean aquaculture research. The agency granted more than **\$1.7 million** for collaborative research in support of offshore aquaculture in New England...

“The Gulf of Mexico Offshore Aquaculture Consortium proposed to raise fish adjacent to a Chevron natural gas platform, but it abandoned the project when funding expired in 2003.”

quotes above from <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/problems/offshore-aquaculture-government-funding>

SOCIOECONOMIC IMPACTS

HOT will have “22 full-time equivalent positions” *DEIS p. 2-93*

How many will be full-time positions with benefits—health insurance, retirement, sick days, vacation, etc?

Estimate how many fishers will lose their livelihood as a result of the ahi farm, and how many of them will be hired by the farm.

BANKRUPTCY

Evaluate whether HOTI should post a bond in case it goes out of business, for disposal of the pens and all fish, work boats, and all dockside equipment and material.

DISASTER

“The Proposed Action would use self-stabilizing technology to position the Oceansphere...” *DEIS p. 2-23*

“ ‘We have a patent application filed (for) 21 separate inventions’ related to the project, Spencer [HOT CEO] said.” *Ahi farm proposed off Kohala, Hawai’i Tribune-Herald, 2-26-09, p. A 1.*

Specify how often the sphere will be checked, and by who, to ensure all the new technology is working as planned.

Aquaculture “cages...could become marine debris in the event they are damaged or pulled free by violent weather or human error....During violent storms in the past, whole oil rigs have been ripped from their stations and brought to shore.” *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>*

Describe plans to retrieve the pen, protect human and marine life, protect natural resources and property, prevent fish escapes, and mitigate impacts of escaped and dead fish, if the pen moves out to sea, into the path of boats, or onto shore. Include comments from all relevant government agencies.

“...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.” *DEIS p. 2-98*

There should be enough data available on tsunamis and the damage they cause to greatly expand this evaluation.

Identify who will make the evacuation/ removal decision--project staff? Government officials?

State whether "evacuated" means some or all of the fish will be released.

Evaluate impacts assuming the pen existed during all tsunamis and alerts in the past 75 years that would have triggered evacuation. Evaluate whether there would have been time for evacuation and removal.

Evaluate the impacts of the pen being lost at sea, and all the fish escaping or dying, in a tsunami.

INSURANCE/ BOND

"It has been the case with the two ocean leases granted to open ocean aquaculture operation in the state, the lessees are required to purchase comprehensive insurance for recovery and removal of any lost or damaged farm materials, and for any other damage that might be inflicted by the farm." DEIS p 2-15

Specify what type and amount of insurance HOTI will purchase.

"Establish a trust fund or bond requirement for bankruptcy, abandonment, unexpected damages" recommendation from Open Ocean Aquaculture: the Future for Florida and the Gulf of Mexico? Power Point by Marianne Cufone, vice chair of Gulf Council Offshore Aquaculture Advisory Panel

http://www.who.edu/cms/files/jmcdowell/2006/7/Cufone_Open_Ocean_Aquaculture_0306_12253.pdf

State whether this will be done, the dollar amount, and what organization will hold the trust fund or bond.

SECURITY

Specify measures that will be taken to prevent vandalism and accidental damage from the public.

FISH FEED

"According to the EIS, ahi require two pounds of dry feed for every pound of growth." Ahi farm proposed off Kohala, Hawai'i Tribune-Herald, 2-26-09, p. A 1.

"...three or more pounds of wild fish are required to produce one pound of farmed fish." Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 10, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

Explain the discrepancy between these two statements.

"Many species of small fish ground up for aquaculture feed are being harvested beyond sustainable levels, meaning the predatory finfish, such as tuna, salmon, grouper, and snapper, that depend on them for survival also are in jeopardy...Kona Blue in Hawaii has pledged to find [vegetable]... replacements, but so far it has only been able to replace half of its fishmeal and a fourth of its fish oil with vegetable ingredients. Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

"Scientists are finding evidence of widespread malnutrition in commercial and recreational fish, marine mammals, and seabirds because of the global depletion of small fish...These 'prey fish' underpin marine food webs and are being steadily exhausted by heavy fishing, increasing demand of aquaculture feed, and climate change...the biennial State of the World Fisheries and Aquaculture report by the U.N. Food and Agriculture Organization (FAO)...concludes that 80% of all marine fish stocks are currently fully exploited, overexploited, depleted, or recovering from depletion; including stocks of the 7 largest prey fisheries. Very few marine fish populations remain with the potential to sustain production increases, and more have now reached their limit than ever before." New Oceana Report Shows Depletion of Prey Fish may be Starving the Ocean, <http://oceana.org/north-america/what-we-do/hungry-oceans/>

"... feeds currently used in aquaculture production rely, in part, on ingredients derived from wild-caught fish, raising concerns that an expanded aquaculture industry could result in over-fishing certain species, such as anchovies, which are used in aquaculture feeds." *Offshore Marine Aquaculture, GAO report, May 2008. p. 2.*

"Some aquaculturists argue that catching small, low trophic level fish to feed large, high trophic level fish... is more efficient than leaving small fish in the ocean to be consumed by wild predatory fish caught by fishermen... The relative efficiency of fish farming versus fishing is difficult to quantify, in part because energy transfer between trophic levels in marine systems is not well documented... capturing low trophic level wild fish for aquaculture feeds, with little concerns for the effect on higher trophic level wild fish, could form the basis for economically rational--although not ecologically sound--ocean management."

Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 24,
<http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

"Continued growth in marine aquaculture production could outstrip the current supply of fish used for fish meal and oil production, potentially jeopardizing the industry's economic sustainability." *Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 23,*
<http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

Evaluate the project's economic and environmental sustainability in light of the above statements.

Evaluate another alternative--the traditional Chinese approach of farming herbivorous or omnivorous fish to provide food for carnivorous farm fish.

Fish Farming Goes Back to its Roots, B. Roman, OnEarth online, 1-5-09, <http://www.onearth.org/node/819>

LACK OF OXYGEN

Evaluate whether there are seasonal anoxic (no oxygen) conditions at pen depth and evaluate any impacts on the fish.

CONTAMINANTS

Consider this background information--

"Antibiotics, pesticides, growth enhancers, and other drugs or chemicals used in these operations also can be damaging... Antibiotics can kill beneficial seafloor bacteria ... little is known about the long-term effects of aquaculture drugs." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"Farmed fish can contain a variety of different chemicals and heavy metals. Kept in stationary cages in high numbers, farmed fish are more prone to disease and parasites, often requiring use of antibiotics and other substances. Furthermore, farmed fish are grown to be larger than wild fish and are given feed composed of highly concentrated, processed wild fish. Wild fish typically contain small amounts of mercury and other heavy metals. When they are processed into fish feed for farmed fish, the heavy metals become more highly concentrated, therefore increasing the levels of heavy metals in farmed fish who eat the feed. Taken at these levels, heavy metals could pose serious health risks to humans." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>*

"In the case of salmon, farmed fish contain higher levels of PCBs, dioxin, flame retardants, pesticides, and other toxins than wild fish because these contaminants are often present in the fish that are ground up for feed." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

Specify which of these substances will be used, in what amounts, and how often, both before fish are ready for the pen, and after they are in the pen--

Antibiotics--state whether they are the type used to treat disease in humans

Growth-enhancing substances

Other pharmaceuticals and drugs

Pesticides

Cleaning agents

Anti-fouling agents

Other chemicals

For all substances

Evaluate effects on farm and wild fish, and on people eating both

Evaluate effects on the ocean environment, from the substances entering the ocean directly, and/or in unconsumed feed, metabolic waste, and dead fish

Describe how farm fish will be tested for residues of the substances, and for PCBs, dioxin, flame retardants, pesticides, and heavy metals

Identify which government agencies monitor use of each substance. Describe the reporting system. Identify reliable funding sources.

For substances that will not be used, describe the monitoring plan to ensure they are not used, and identify reliable funding sources.

DISEASE

"Tuna health will be continuously monitored." DEIS p 2-11

Specify what type of government oversight is planned and who will pay for it.

"If disease should occur the affected tuna will be removed from the Oceansphere." DEIS p 2-11

Specify how workers will determine which fish are diseased and how they will catch individual fish.

Specify how diseased fish will be disposed of, in a manner that does not spread disease.

"Packed tightly fish rub against each other and the sides of their cages, damaging their fins and tails and becoming sickened with various diseases and infections." Wikipedia

Evaluate these risks and describe measures that will be taken to avoid them.

"In addition to sea lice from salmon farms, Whirling disease has spread from farmed to wild trout in more than 20 Northeastern and Western states. This parasite, which deforms and disorients young fish, has killed up to 90 percent of wild trout in some western U.S. streams.⁶ Disease transmission is a particularly difficult problem to assess and prevent, because very little is known about disease mechanisms among wild fish....Disease struck the University of New Hampshire's experimental fish farm several years ago, killing most of the entire stock of 200,000 juvenile cod, though apparently not entering the environment." Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

Include this information in the EIS.

GENETIC ENGINEERING

Will the fish be genetically engineered? If so--

Evaluate impacts on wild fish from inevitable escapes

Evaluate health impacts on people who consume the fish, using independent, peer-reviewed studies not funded by industry

Evaluate whether Japan accept them. They don't accept GE papayas.

Specify how will consumers be informed that the fish are GE.

If plans change in the future to include GE fish, how will the public be notified?

GENETIC DIVERSITY

Will selective breeding be done? If so, evaluate impacts

Specify measures that will be taken to maintain genetic diversity.

"Limit stock to first generations" recommendation from Open Ocean Aquaculture: the Future for Florida and the Gulf of Mexico? Power Point by Marianne Cufone, vice chair of Gulf Council Offshore Aquaculture Advisory Panel
http://www.whoi.edu/cms/files/jmcdowell/2006/7/Cufone_Open_Ocean_Aquaculture_0306_12253.pdf

Will this recommendation be followed? If not, evaluate impacts.

ESCAPES

"About 1,500 of Kona Blue Water Farms'... fish were accidentally released...in early December, the company said today [January 4, 2009]...The fish escaped after a diver failed to fully close one of the fish pens..." Fish escape underwater cage off Keahole Point, Honolulu Advertiser,

1-4-08

How promptly will HOTI report escapes?

What measures will be taken to avoid human error causing escapes?

Evaluate impacts of escapes of gametes, embryos, eggs, and fish (early stages of selective breeding, genetically engineered, and/or diseased fish) in light of the following--

"Critics speculate that, since selectively bred and genetically modified fish may grow faster and larger than native fish, they could displace native fish in the short term...but might not be able to survive in the wild for the long term."
Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 11, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"The experience with salmon farming indicates that escaped fish could easily be a problem...through competitive displacement of native species." Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 11, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"Escapes of farmed salmon...are well documented...Numerous studies have documented the ecological damage caused by escaped farm fish...these may include reduced fitness of wild fish as a result of interbreeding...The impacts of fish escapes may not be recognized until they are irreversible..." Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 24, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersin ecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

"... fish may escape from an aquaculture facility, whether nearshore or offshore, and interbreed with wild fish, potentially reducing the ability of wild fish to survive." *Offshore Marine Aquaculture, GAO report, May 2008. p. 2.*

"Farmed fish are bred to grow fast and reproduce often. When these fish escape, they can disrupt the natural ecosystem by requiring more food than wild fish and by interbreeding with natural populations. Even though the farmed fish may be bigger and more aggressive, they also may be less fit for living in the wild because traits important to survive in farms are not the same as those needed in the wild. The farmed fish can pass on lower quality genes to wild fish, making the whole population weaker." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>*

"About 2 million farmed salmon escape into the North Atlantic each year, equal to the number of wild fish there... In the first six months of 2007 alone, more than 100,000 Atlantic salmon escaped from four facilities on the west coast of Scotland. The incidents led a representative of one Scottish fishing group to recommend an outright end to open ocean aquaculture... Several years ago, thousands of fish escaped from Kona Blue Water Farms in Hawaii when a cage broke." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"Neither pens nor cages will prevent fish eggs from escaping." *Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 24, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>*

WASTE FROM FISH IN PEN

Opinions should be sought re. effects on the sea floor from the few scientists who have studied this subject for offshore fish farms in Hawai'i, even though their studies appear to be for shallower water than the HOTI project.

Include this information in analysis.

"Cates took over the operation [Cates International off O'ahu] from Charles Helsley, a long-time University of Hawaii researcher who in 1998 started the Hawaii Offshore Aquaculture Research Project, or HOARP... Helsley said when the seafloor near the cages was examined for adverse effects, 'We saw nothing! No change at all... There was no significant change [in the seafloor ecosystem], as the media has so often reported as having occurred beneath salmon pens.' In reality, worms associated with fecal pollution had appeared 'rapidly' and 'became much more abundant under the net cage,' according to Hawaii Pacific University's Oceanic Institute.... In 2006, a research team reported that the facility had 'grossly polluted; the seafloor and 'severely depressed' certain types of sealife. 'Despite the open ocean location and alongshore currents, the effects of fish feed and waste on the [seafloor] community were evident.' The ecosystem had been 'drastically changed,' they found, and the effects had spread beyond the area beneath the cages. In conclusion, the researchers wondered whether the seafloor could ever return to normal... Though he insists the operation hasn't harmed water quality, Helsley has never tried to publish his data. 'I am remiss in not writing up the water quality work,' he said, explaining, 'It is difficult to write up a negative result paper and get it published.' *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/life-in-the-industrial-aquaculture-facilities>*

Note that Charles Helsley, founder of the Hawaiian Open-ocean Aquaculture Research Program, which found little change in benthos under the Cates International fish farm (see DEIS p. 2-54), was also in charge of that fish farm one point.

HOARP appears to have relied on a personal communication from Randy Cates, instead of actual photos, to say there was no visible change, seen in photos, of the seafloor. (Environmental Observations around Offshore Cages in Hawai'i, Charles Helsley, p. 3)

Include and analyze this information--

"... species diversity did not increase significantly during the [6-month] fallow period, indicating that the affected communities had not been fully restored to pre-culture or distant reference conditions..."

very few studies have investigated the effectiveness of... [the] 'dilution solution' [off offshore

sites] for farms operating at commercial-scale production rates...

The National Offshore Aquaculture Act of 2005...drew strong criticism for omitting proper legal safeguards against any environmental impacts...

It is possible that the environmental effects of organic enrichment can be mitigated by planned cessations in farming operations or rotational 'fallow periods' among multiple farming sites, net-pens or fish cages...Mandatory fallow periods have been instituted in Maine and Norway to 'break the life cycle' of fish parasites and diseases...

Bybee & Bailey-Brock 2003, Lee et al. 2006...documented reduced benthic invertebrate diversity, low oxygen levels in surface sediments and increased abundances of organic enrichment indicator species in locations closest to the commercial fish farm [in Mamala Bay off O'ahu]...

We provide evidence suggesting a partial recovery of previously degraded infaunal polychaete communities during the fallow period, as well as their sudden decline after farming operations resumed...

The difference in polychaete species diversity between reference and affected sites was not significantly lower during the fallow period in comparison with normal operational sampling periods....

...species diversity at the end of the 6 mo fallow period remained significantly lower below the fish farm at the affected site relative to a distant reference site...

The relative lack of change in community structure at these [reference] locations...indicates an absence of any major seasonal trends or natural succession patterns—a stark contrast to the affected community...

...at the end of the fallow period...evidence suggests a rapid return to earlier affected conditions...

Our study presents a unique case with an offshore aquaculture operation in relatively fast currents (30 to 50 cm s⁻¹)...

Partial recovery of infaunal communities during a fallow period at an open-ocean aquaculture, Lin and Bailey-Brock, Marine Ecology Progress Series, vo. 371: 65-72, 2008.

Include and analyze this information--

“Sediment samples collected directly below the fish enclosures were compared with sediment collected 300 m upcurrent. Total organic carbon was 25–37% higher in the control

compared with cage samples and ammonia was 30–46% higher in cage samples. Sulfate reducing bacteria (SRB) counts were 36% higher in cage sample sediments...

A mathematical model developed for prediction of organic material deposition suggests that while currents will reduce fecal loading and feed deposition beneath a cage, there is expected to be sufficient nutrient addition to impact those sediments. Time series or statistical information on the current field beneath the fish cages are needed to apply the model for predicting locations of high deposition. This would contribute to the development of a comprehensive monitoring program that would sample multiple locations over time to generate an accurate and comprehensive depiction of the environmental impacts of this new and expanding commercial endeavor....

In oligotrophic marine environments, addition of various nutrients through feed, detritus, and fecal matter can induce changes in the macro-, meio-, and microfauna community structure in the water column and sediment (La Rosa et al., 2001). Bacterial communities are especially sensitive to changes in the local environment. In sediments, studies have demonstrated that accumulation of large amounts of organic matter induce persistent changes in bacterial assemblages... Comprehensive characterization of microbial populations in regions adjacent to aquaculture operations are important indicators for the prevention and treatment of various diseases that can affect farmed fish stock, and for maintenance of water quality....

...there currently is insufficient information to draw any definitive conclusions. Since offshore mariculture is expanding in Hawaii, additional studies to identify and quantify impacts are warranted to ensure that facilities are sited, designed, and operated to maximize benefits and to minimize risks.”

*Impact of mariculture on microbial diversity in sediments near open ocean farming of *Polydactylus sexfilis*, Yoza, Harada, Nihous, Li, Masutani, Ecological Indicators 7 (2007) 108–122.*

Include and analyze this information--

“Regression analysis indicated significant decrease in Shannon-Weiner diversity over time and near the effluent source. Non-metric multidimensional scaling... showed a progression of species succession and turnover at impacted sites but

relatively unchanging polychaete communities at control sites. An analysis of similarity...indicated significant difference between community structures at impacted and control sites but less obvious differences over time. An abundant and regionally widespread polychaete...had disappeared from the impacted sites. Increasing abundances of 2 opportunistic polychaetes...resulted in decreasing Shannon-Weiner diversity values...at impacted stations...3 species [observed] may represent an order of succession due to attrition by anoxia...Deviation of the infaunal polychaete community at impacted sites...low species richness...and depressed community abundance reflect the effects of fish mariculture on the benthic community. Such effects may be diluted by the open-ocean location...

This study illustrates a change in macrobenthic community composition from a native assemblage to one dominated by indicator species in response to mariculture activity...

Oxidation-reduction potential...measurements at impacted sites were consistently lower than measurements at control sites...The difference between ORP measurement from control and impacted sites increased since the initial sampling...samples [from under the fish farm] had redox potentials consistently below the range of the meter used, which coincided with sulfuric odors detected by collectors. Such effects are not observed at other sites...

Anaerobic conditions may influence ecological dynamics of the benthic system....

[under the fish farm] evolved in to a grossly polluted site with a severely depressed polychaete community...The polychaete community found 80m down-current...followed, indicating that the footprint of effect had spread...to nearby environments...

[there was] little species turnover occurring in control sites compared to high species turnover in impacted sites....

The conclusions...indicate that the gradual buildup of organic detritus under the cage has drastically changed the infaunal community structure by displacing indicators of healthy benthic environments...with indicators of organic enrichment...

...the benthos [under the fish farm]...reached grossly affected conditions within 13 mo...the benthos [at a nearby site]...reached indicated heavily impacted conditions in 23 mo...

Despite the open-water location and alongshore currents, the effects of fish feed and waste on the benthic polychaete community were evident.”

Temporal changes in the polychaete infaunal community surrounding a Hawaiian mariculture operation, Lee, Bailey-Brock, and McGurr, Marine Ecology Progress Series, vol. 307: 175-185, 2006

Include and analyze this information--

“ammonia levels...tended to increase slightly...polychaete... became more abundant in the benthos directly underneath the cage than at control sites indicating a community response to increased organic load...” *Offshore Culture of the Pacific Threadfin...in Hawaii: Results of the Hawaii Offshore Aquaculture Research Project* Ostrowski et al. 2002

Include and analyze this information--

“Economic sensitivity analyses revealed that improvements in biological aspects of the operation were needed to reduce risk and improve the bottom line....

...ammonia levels during peak biomass months generally increased slightly downstream from

the cage, and were diluted to upstream levels, in most cases, at the downstream + 30 m site

...All sample dates from August 31 – November 3 during peak biomass, indicate downstream values higher than the upstream values.

Total nitrogen levels did increase nearly 7-fold once fish were inside the cage...

Means for total nitrogen and ammonia both exceeded DOH standards slightly, while total

phosphorus was more than twice the allowable level...

...there was an increase in ammonia directly downstream from the cage four hours after the

first feeding of the day, which would become diluted approximately 15m downstream. In

most instances, ammonia reached ambient, upstream levels, 30m downstream from the

cage...

....there was a noted increase in dorvilleids under the net. November samples indicated

significant differences in nematodes ($p = .044$) and *Ophryotrocha* ($p = .007$), which continued

to increase..

The fate of the discharge of metabolic products from the cage system is still unknown and

raises major questions with regulatory agencies. Moreover, the long-term effects of cage

culture on the benthic biota and on the ecosystem outside the cage must be defined.

Improvements in overall biological performance of Pacific threadfin and modeling of effluents

from offshore operations will be necessary to establish environmentally and economically

reasonable monitoring requirements for large scale operations.”

Hawaii Offshore Aquaculture Research Project, (HOARP) Phase II Final Report, April 1, 2000 – February 28, 2001, Ostrowski, Bailey-Brock, Leung.

“After 3 years of continuous production, the recovery period [for species living under the fish pens] was about 9 months rather than the 3 to 6 months previously observed.” *Environmental Observations around Offshore Cages in Hawai'i, Charles Helsley, p. 3.*

Is the recovery period longer if pens are on-site longer?

Evaluate environmental impacts from changes in species living under the HOT fish farm, when the farm is running continuously at full capacity, with no breaks for species to recover.

The Hawaiian Open-Ocean Aquaculture Research Program found the “only change in the benthos was an increase in the abundance *Capetella capitata* and *Neanthes arenaceodentata*, known indicator species of organic enrichment. The increase in abundance of these two species... suppresses the abundance of the... normal assemblage. This change, however, was shown to be entirely reversible in time periods of less than a year of production, and thus it should not be considered to be a long-term detrimental impact.” *DEIS p. 2-54*

Are effects still reversible after several years, and for what size fish farm?

“The OOA operation off ‘Ewa Beach, O‘ahu experienced periodic increases in abundance of polychaete worms... underneath the platforms but also showed occasional periodic increases in abundance of benthid detrital feeders at the control sites...” *DEIS p. 2-58*

How large, frequent, and species-specific were increases beneath the platforms, compared to increases at control sites?

“...the water quality model and water quality data collected on September 14, 2007...[lead] to the conclusion that there will be little impact to water quality.” *p. DEIS 2-40*

“Initial sampling to determine baseline conditions was conducted on September 14, 2007.” *DEIS p. 2-43*

One sample is inadequate. Samples should be collected in several different seasons and several different weather conditions.

“Untreated fish waste, excess feed, and fish carcasses empty directly from cages into the ocean. Based on the little research conducted so far, this waste has been shown to cause oxygen-depleting algae blooms, pollute the seafloor, and alter fragile habitats. Researchers do not know whether the oceans, which have already been damaged by industrial and agricultural pollution, can absorb yet another of source of waste. ‘Little is known about the assimilative capacity of the marine environment for these pollutants,’ concludes a 2007 report commissioned by the Woods Hole Oceanographic Institution. ‘Pollution from a greatly expanded industry could have significant effects locally and regionally.’” *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

Evaluate impacts from waste from fish pens in light of this statement.

“Ongoing environmental monitoring will be done to ensure protection of the environment.” *DEIS p 2-15*

Specify what organization will do the monitoring, the type and frequency of monitoring, conditions that will trigger actions by HOTI and what type of actions, type of government oversight, and reliability of the funding source.

Evaluate how often currents carry materials back to the point of origin in the project area.

Evaluate data from the former Ahi Nui fish farm off Kaua‘i.

ALGAE

Algae “growth will not create a significant impact as long as weather conditions and other factors allowed [sic] the daily cleaning to take place.” *DEIS p. 2-57*

Evaluate impacts when weather or other factors prevent the daily cleaning.

OTHER WASTE

What trash/ debris will be generated and how will it be disposed of?

“The Company will work with the fish processing company to encourage beneficial uses of the processing wastes...” *DEIS p. 2-72*

Include in Final EIS a written agreement with the fish processing company on this.

SHARKS

"When sharks ripped holes in his cages to eat dead fish that had settled to the bottom, [Brian] O'Hanlon [of Snapperfarm in Puerto Rico] says he nearly went out of business... He says he has since fixed the problem." *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/life-in-the-industrial-aquaculture-facilities>

"... dead fish...[were] shown in other OOA projects to attract sharks...when weather prevents daily cleanings." *DEIS p. 2-64*

"An increase in resident sandbar sharks...did occur in the second stage of the 'Ewa Beach platform trials... The need to remove sharks is not incidental and in fact may be a necessary part of the success of the operation." *DEIS p. 2-66*

"... there could be renewed interest in killing 'problem' animals, as has been the case with salmon farmers killing seals and sea lions... great white sharks, an endangered species, have found their way into tuna farms in Australia on several occasions." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, pp. 11-12*, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"...caged fish can serve as bait for unwelcome predators. 'Will they attract sharks? Yes, they will...,' Cates told a reporter... To deal with this, Hawaii's state Legislature in 2005 approved a study to determine whether sharks could be a threat to surfers and swimmers." *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/life-in-the-industrial-aquaculture-facilities>

"...KBWF was required to kill [a]... shark in order to maintain the safety of divers... Sharks are undergoing worldwide declines... Sharks of the eastern Pacific are among the most threatened regionally..." *DEIS p. 2-49*

Describe alternatives, other than killing, to keep sharks and other predators from damaging the fish farm, and to protect employees, swimmers, and surfers from any sharks that are attracted. State how many sharks HOTI expects to kill and whether any are endangered. Describe the significance of sharks in native Hawaiian culture. Include results of the study approved by the State legislature in 2005, if it was conducted.

SUSTAINABILITY

Evaluate environmental sustainability of the project in light of the following--

"Congress should not allow open ocean aquaculture as it is currently being practiced by the four experimental fish farms in Hawaii, New Hampshire, and Puerto Rico. These operations have not demonstrated that offshore aquaculture can be environmentally sustainable on a commercial scale." *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/life-in-the-industrial-aquaculture-facilities>

"The Pew Oceans Commission (2003) called for a halt to the expansion of marine finfish farms until national standards and a comprehensive permitting authority are established for the siting, design, and operation of ecologically sustainable marine aquaculture facilities." *Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 26*, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

"Should create stringent guidelines to deal with potential problems before permitting facilities to open" recommendation from Open Ocean Aquaculture: the Future for Florida and the Gulf of Mexico? Power Point by Marianne Cufone, vice chair of Gulf Council Offshore Aquaculture Advisory Panel http://www.who.edu/cms/files/jmcdowell/2006/7/Cufone_Open_Ocean_Aquaculture_0306_12253.pdf

MARINE LIFE/ MAMMALS

"Hawaii Oceanic Technology could work with HIHWNMS officials to train staff in appropriate first-response measures, although liability concerns need to be addressed..." *DEIS p. 2-68*

State whether this training will occur.

"Monitoring by qualified observers, preferably third-party qualified biological resource personnel, of [marine mammals and sea turtles] would be required... Surveying should be done daily by cleaning and maintenance personnel...also...at least once a week initially" *DEIS p. 2-65*

Specify what organization will supply observers and surveyors, how often they will work, and who will pay.

"Preparation and presentation of a Marine Mammal Monitoring Plan will be incorporated into the project design." *DEIS p. 2-65*

The MMMP should be included in the EIS.

"Sound devices at farms to harass animals and keep them away could harm marine mammals." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 11, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

If these will be used, evaluate impacts.

Evaluate effects on the humpback whale sanctuary one mile away.

Evaluate effects of sucking up sea water. How will this affect benthic and pelagic marine life?

Will marine life become entangled in hoses?

ENERGY/ CARBON

The project "is superior to conventional methods of fishing and trolling for tuna as it has a smaller carbon footprint... [and] burns less fossil fuels..." *DEIS p. 2-72*

Analyze whether this is true when one includes the fuel use and carbon footprint from--

Fish feed--catching small fish, growing vegetables, transporting fish and vegetables to factory, making fish feed, transporting feed to fish farm

Construction--transporting materials to the site and building the fish farm

Maintenance--boat trips back and forth to the site

Transporting fish by air to markets outside Hawai'i

Breeding hatchlings

REGION OF INFLUENCE

Expand the ROI to evaluate how this project will affect fishers, communities hosting fish meal manufacturing, and the ocean ecosystem in areas outside Hawai'i, in light of the following--

In Alaska "many commercial fishermen have been put out of business and there have been dramatic changes to coastal communities as a result of expanded salmon farming in other parts of the world." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 8, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"Aquaculture is now the world's largest user of fishmeal and fish oil, consuming about half the world's supply of fishmeal and more than 80 percent of the fish oil each year. Many of the same small fish going into the feed serve as bait for fishing and are also food for the wild fish and other marine life. Less food in the food chain means less wild fish for the fishermen." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-recreational-fishing>*

LEGAL COMPLIANCE

Evaluate compliance with--

The Coastal Zone Management Act, both to operate the open ocean site, and to transport staff, feed, and fish between the site and shore?

The Clean Water Act and National Pollutant Discharge Elimination System, including sec.

403 (c), which requires special review for aquaculture facilities in offshore federal waters?

Army Corps of Engineers requirements

Coast Guard requirements

The Magnuson-Stevens Fishery Conservation and Management Act

Marine Mammal Protection Act

Endangered Species Act

West Pacific Fishery Management Council recommendations

United Nations Convention on the Law of the Sea

"The site for the Proposed Action, and the Alternative 2, are both part of the ceded lands trust..." DEIS p. 2-25

Evaluate whether rent is fair market rent.

Ceded lands are to be used for the benefit of the public. Explain how the project will benefit the public, in light of all the concerns raised in these comments.

Evaluate the issue of privatization of the ocean in light of these statements--

"Traditionally, near shore waters and their resources under state jurisdiction are considered to be held and managed 'in the public trust.' [as are ceded lands] Open ocean aquaculture may be perceived by some as the de facto privatization of the ocean, which has historically been considered a common property resource...significant questions remain concerning whether an appropriate mechanism exists for any federal agency to provide an open ocean aquaculture lease applicant with the necessary property rights..." Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 6, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"The idea of farming in the ocean, which has been traditionally regarded as a wilderness open to all, adds a complicating dimension to the discussion." 2007 Woods Hole report, quoted on Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

MISCELLANEOUS

"The Oceansphere will be removed when it is not in use." DEIS p 2-15 Specify how often this will occur.

"maximum production...[will be] 6000 tons...per year." p. 2-33

Are all impacts evaluated for this maximum?

REPORTS AND STUDIES--evaluate impacts in light of these--

Environmental Observations around Offshore Cages in Hawaii, Helsley, School of Ocean and Earth Science and Technology.

Future seascapes, fishing, and fish farming, Goldberg and Naylor, *Front Ecol Environ* 2005, 3(1): 21-28.

Hawaii Offshore Aquaculture Research Project, (HOARP) Phase II Final Report, April 1, 2000 – February 28, 2001, Ostrowski, Bailey-Brock, Leung.

Hungry Oceans: What Happens When the Prey is Gone? -- Oceana

Impact of mariculture on microbial diversity in sediments near open ocean farming of *Polydactylus sexfilis*, Yoza, Harada, Nihous, Li, Masutani, *Ecological Indicators* 7 (2007) 108–122.

Offshore culture of the Pacific threadfin... results of the Hawaii Offshore Aquaculture Research Project, Ostroski, Helsley, Chambers, Apeitos, Zimmerman, Cates, Bailey-Brock, Leung, Kam, Bybee, from Ocean Sciences meeting 2002.

Open Ocean Aquaculture, Borgatti and Buck, Congressional Research Service, December 13, 2004.

Partial recovery of infaunal communities during a fallow period at an open-ocean aquaculture, Lin and Bailey-Brock, *Marine Ecology Progress Series*, vo. 371: 65-72, 2008.

State of the World Fisheries and Aquaculture report, U.N. Food and Agriculture Organization (FAO)

Temporal changes in the polychaete infaunal community surrounding a Hawaiian mariculture operation, Lee, Bailey-Brock, and McGurr, *Marine Ecology Progress Series*, vol. 307: 175-185, 2006

Bill Spencer

From: Bill Spencer [bspencer@hawaii.rr.com]
Sent: Thursday, April 09, 2009 2:58 PM
To: davidtarnas@hawaii.rr.com; 'Paul Troy'
Subject: FW: Ahi aquaculture

fyi

From: Redpath, George [mailto:George.Redpath@tetratech.com]
Sent: Thursday, April 09, 2009 12:43 PM
To: Bill Spencer
Subject: FW: Ahi aquaculture

Comments from Cory (See Below) – Looks like she read the EA, which I would suspect. Haven't read them all, but looks like they can be answered ok?

George Redpath | Associate Director
Tel: 808.533.3366 | Fax: 808.533.3306 | Cell: 808.371.9179

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Please consider the environment before printing this email.

From: Cory (Martha) Harden [mailto:mh@interpac.net]
Sent: Thursday, April 09, 2009 10:56 AM
To: Redpath, George
Subject: Ahi aquaculture

please acknowledge receipt

attachment is identical

COMMENTS ON

AHI AQUACULTURE PROJECT, KOHALA COAST, HAWAII

DRAFT ENVIRONMENTAL IMPACT STATEMENT, DECEMBER 29, 2008

By Ms. Cory Harden, Sierra Club, Moku Loa group, PO Box 1137, Hilo, Hawaii 96721

808-968-8965, mh@interpac.net

SUMMARY

We support sustainable use of ocean resources through ecologically based integration of conservation, wild-caught fishing, and fish farms, with well-informed and reliably funded regulation.

For Hawai'i Island fish farming, we support local production of fish feed, minimizing of impacts on the ocean floor and water quality, and use of most of the fish as food for island residents.

Our concerns about this project include:

There is little research on open-ocean fish farming in Hawai'i, and little independent research nationally. Opinions re. effects on the sea floor should be sought from the few scientists who have studied this subject for offshore fish farms in Hawai'i

Impacts of sucking up sea water to run the propulsion system should be analyzed

The region of influence should be expanded to areas used to provide small fish (in light of overexploitation of many fish) and vegetables for fish feed, and to all areas where jobs may be lost

Farming small fish for feed, instead of shipping in feed, should be evaluated

For all drugs and chemicals that will be used, details of use should be described; effects on farm and wild fish, consumers, and the ocean environment evaluated; and the monitoring system for planned and unplanned use described--including funding sources

Monitoring for disease and parasites should have reliably funded government oversight

Measures to maintain genetic diversity should be described, plus plans for reliably funded monitoring

Measures to prevent escapes of fish, gametes, embryos, and eggs should be described, along with plans for prompt notification of the public if escapes occur

A bond and/or insurance should be required to cover bankruptcy or disaster

More extensive analysis should be done on the effects of tsunamis on self-stabilization

Measures to prevent vandalism and accidental damage should be planned

Shipping one and a third shipping containers of fish feed a day 3000 miles, then flying most of the fish 3000 miles to market, does not appear sustainable

Whether profits will stay in Hawai'i should be clarified

The project may not be economically viable, given that small fish for feed are over-exploited; an increased supply of ahi may lower prices; few offshore fish farms have succeeded without large amounts of government support; and Kona Blue, plus fish farms in New Hampshire and Puerto Rico, are having financial problems

Impacts of privatizing part of the open ocean should be analyzed

Thank you for considering our comments.

SPECIFIC COMMENTS

RESEARCH

Evaluate the validity of research used for this DEIS in light of the following:

"Most of the NMAI [National Marine Aquaculture Initiative]-funded research has been conducted to support and help promote the aquaculture industry and often has been done in collaboration with the industry. There has been minimal independent research, especially on environmental and socioeconomic impacts." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 15, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"Additional research needs to be conducted on the effects, including cumulative and secondary impacts, of aquaculture on the marine environment." *2007 Woods Hole report, quoted on Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"OOA is a recent phenomenon...[there is] limited research available to reference..." *DEIS p. 2-39*

ECONOMICS

For any government grants, specify amounts, conditions, expiration dates, and plans for funding after grants expire.

"Hawaii Oceanic Technology's target market is the US mainland and Japan, where the selling prices would be twice as profitable as the local market." *DEIS p. 2-93*

Analyze whether this will still be true given future fuel prices, and future lowering of tuna prices when more tuna is available.

HOT will "revitalize Hawai'i's reputation as a source of high quality, sashimi-grade tuna." *DEIS*

p. 2-94

Farmed fish are sometimes more flabby than wild fish. Will they still be sashimi-grade?

Compare nutrition levels and fat content of farmed and wild fish and specify how these will be publicized.

How much of the profits will stay in Hawai'i, and how much will go elsewhere?

Evaluate the project's economic viability in light of the rest of this section--

"Kona Blue Water Farms is not profitable now, according to the document [draft supplemental EA], in part because of the significant costs related to frequently sending divers down to clean the cages and because rough water conditions sometimes prohibit raising the cages and harvesting..." *Kona fish farm in too deep, Hawai'i Tribune-Herald, 3-19-09, p. B 1-2*

[Kona Blue] "...says it must cut production because it's not making enough money." *Kona Blue cuts isle production, Hawai'i Tribune-Herald, 3-30-09.*

"...a major challenge is likely to be whether U.S. open ocean aquaculture operations can produce their product at prices competitive with foreign aquaculture." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 4, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"...expanded production of farmed fish could lower prices..."

Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 22, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

"...high capital start-up costs make estimating profitability and securing financing difficult for new open ocean aquaculture companies." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 3, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"...researchers in Hawaii told us that the development of healthy breeding fish to supply offshore aquaculture operations can often require years of intensive breeding efforts, but that it is difficult to obtain consistent research funding over this long time period." *Offshore Marine Aquaculture, GAO report, May 2008. p. 6.*

"...workers and supplies could have to travel very long distances." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"...the location of the aquaculture facilities away from shore will necessitate high variable costs such as fuel, feed, and security and/or surveillance." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 3, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"...marine aquaculture has proven profitable elsewhere, especially in areas with little or no environmental regulation and/or enforcement [unlike the U.S.]..." *Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 8, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>*

"Located in Hawaii, New Hampshire, and Puerto Rico...all of these [aquaculture] operations have received government subsidies, making it impossible to demonstrate whether they can survive under true free market conditions." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/introduction>*

"...while the federal government has spent millions of dollars funding offshore aquaculture research and demonstration projects on both U.S. coasts and in Hawaii and Puerto Rico, the commercial viability of the fledgling industry has yet to be proven...."

"... 'offshore' or 'open ocean' aquaculture...rarely has been achieved on a small scale and, in most cases, with significant government support...."

Randy Cates, president of the Hawaiian aquaculture company Cates International [which operates off O'ahu] , admits that a significant investment of government funds would be needed to subsidize the development of an offshore aquaculture industry in the United States...

From 1998 to 2007, Kona Blue or its parent company, Black Pearls, Inc., received nearly **\$1.8 million** and Cates received about **\$150,000** in grants from the Department of Commerce. The department also granted nearly **\$1.3 million** for collaborative research in support of offshore aquaculture in Hawaii...

Two miles off Culebra, Puerto Rico, Snapperfarm, Inc. raises cobia in collaboration with researchers from the University of Miami and the University of Puerto Rico. The operation produces only 50 tons of fish per year in three cages, but hopes to increase production and acquire permits to add five more cages. However, University of Miami scientist Daniel Benetti admits that 'low survival rates due to disease outbreaks both at the hatchery and at the growout stages are currently causing severe economic impact and compromising the commercial viability of the operations.'...

From 1999-2007, Snapperfarm, Inc. directly received close to **\$60,000** from the Department of Commerce for offshore aquaculture. Researchers also received close to **\$2.3 million** in support of open ocean aquaculture in the Caribbean. Additionally, Congress appropriated more than **\$1.8 million** of USDA funds for general aquaculture research in Florida....

Richard Langan, director of the University of New Hampshire's Atlantic Marine Aquaculture Center, has high hopes for offshore aquaculture. "Certainly the potential is in the many millions of dollars..."¹¹ Langan said...

However, for the years 1997-2006, UNH sold only about 6,500 pounds of fish raised in offshore cages, totaling \$23,711, despite receiving hundreds of thousands of dollars in government subsidies. In 2005 and 2006, the center made 11 sales of cod and 1 sale of cod guts to five Northeastern companies. Despite UNH's statement to NOAA that "halibut, haddock

and cod — all of which have been raised from offshore cages — have excellent potential for commercial development,”¹² the center had not sold any halibut or haddock as of 2006, according to UNH invoices obtained by Food & Water Watch through a public records request. Although UNH’s program is not a commercial operation, these figures indicate that in the 10 years since it was founded, the program has not demonstrated that open ocean aquaculture is commercially viable...

The New Hampshire hatchery, Great Bay Aquaculture, provides UNH and Snapperfarm with juvenile fish for offshore aquaculture. The company also plans to raise cod in cages off the Maine coast. George Nardi, head of Great Bay, echoes Cates’ request for more funding: ‘We need \$50 million, not \$5 million.’ ...

“From 1999 to 2007, Great Bay Aquaculture received nearly **\$250,000** from the Department of Commerce for open ocean aquaculture research. The agency granted more than **\$1.7 million** for collaborative research in support of offshore aquaculture in New England...

“The Gulf of Mexico Offshore Aquaculture Consortium proposed to raise fish adjacent to a Chevron natural gas platform, but it abandoned the project when funding expired in 2003.”

quotes above from <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/problems/offshore-aquaculture-government-funding>

SOCIOECONOMIC IMPACTS

HOT will have “22 full-time equivalent positions” *DEIS p. 2-93*

How many will be full-time positions with benefits—health insurance, retirement, sick days, vacation, etc?

Estimate how many fishers will lose their livelihood as a result of the ahi farm, and how many of them will be hired by the farm.

BANKRUPTCY

Evaluate whether HOTI should post a bond in case it goes out of business, for disposal of the pens and all fish, work boats, and all dockside equipment and material.

DISASTER

“The Proposed Action would use self-stabilizing technology to position the Oceansphere...” *DEIS p. 2-23*

“ ‘We have a patent application filed (for) 21 separate inventions’ related to the project, Spencer [HOT CEO] said.” *Ahi farm proposed off Kohala, Hawai’i Tribune-Herald, 2-26-09, p. A 1.*

Specify how often the sphere will be checked, and by who, to ensure all the new technology is working as planned.

Aquaculture “cages... could become marine debris in the event they are damaged or pulled free by violent weather or human error.... During violent storms in the past, whole oil rigs have been ripped from their stations and brought to shore.” *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>*

Describe plans to retrieve the pen, protect human and marine life, protect natural resources and property, prevent fish escapes, and mitigate impacts of escaped and dead fish, if the pen moves out to sea, into the path of boats, or onto shore. Include comments from all relevant government agencies.

“...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.” *DEIS p. 2-98*

There should be enough data available on tsunamis and the damage they cause to greatly expand this evaluation.

Identify who will make the evacuation/ removal decision--project staff? Government officials?

State whether "evacuated" means some or all of the fish will be released.

Evaluate impacts assuming the pen existed during all tsunamis and alerts in the past 75 years that would have triggered evacuation. Evaluate whether there would have been time for evacuation and removal.

Evaluate the impacts of the pen being lost at sea, and all the fish escaping or dying, in a tsunami.

INSURANCE/ BOND

"It has been the case with the two ocean leases granted to open ocean aquaculture operation in the state, the lessees are required to purchase comprehensive insurance for recovery and removal of any lost or damaged farm materials, and for any other damage that might be inflicted by the farm." DEIS p 2-15

Specify what type and amount of insurance HOTI will purchase.

"Establish a trust fund or bond requirement for bankruptcy, abandonment, unexpected damages" recommendation from Open Ocean Aquaculture: the Future for Florida and the Gulf of Mexico? Power Point by Marianne Cufone, vice chair of Gulf Council Offshore Aquaculture Advisory Panel

http://www.who.edu/cms/files/jmcdowell/2006/7/Cufone_Open_Ocean_Aquaculture_0306_12253.pdf

State whether this will be done, the dollar amount, and what organization will hold the trust fund or bond.

SECURITY

Specify measures that will be taken to prevent vandalism and accidental damage from the public.

FISH FEED

"According to the EIS, ahi require two pounds of dry feed for every pound of growth." Ahi farm proposed off Kohala, Hawai'i Tribune-Herald, 2-26-09, p. A 1.

"...three or more pounds of wild fish are required to produce one pound of farmed fish." Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 10, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

Explain the discrepancy between these two statements.

"Many species of small fish ground up for aquaculture feed are being harvested beyond sustainable levels, meaning the predatory finfish, such as tuna, salmon, grouper, and snapper, that depend on them for survival also are in jeopardy... Kona Blue in Hawaii has pledged to find [vegetable]... replacements, but so far it has only been able to replace half of its fishmeal and a fourth of its fish oil with vegetable ingredients. Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

"Scientists are finding evidence of widespread malnutrition in commercial and recreational fish, marine mammals, and seabirds because of the global depletion of small fish... These 'prey fish' underpin marine food webs and are being steadily exhausted by heavy fishing, increasing demand of aquaculture feed, and climate change... the biennial State of the World Fisheries and Aquaculture report by the U.N. Food and Agriculture Organization (FAO)... concludes that 80% of all marine fish stocks are currently fully exploited, overexploited, depleted, or recovering from depletion; including stocks of the 7 largest prey fisheries. Very few marine fish populations remain with the potential to sustain production increases, and more have now reached their limit than ever before." New Oceana Report Shows Depletion of Prey Fish may be Starving the Ocean, <http://oceana.org/north-america/what-we-do/hungry-oceans//>

"... feeds currently used in aquaculture production rely, in part, on ingredients derived from wild-caught fish, raising concerns that an expanded aquaculture industry could result in over-fishing certain species, such as anchovies, which are used in aquaculture feeds." *Offshore Marine Aquaculture, GAO report, May 2008. p. 2.*

"Some aquaculturists argue that catching small, low trophic level fish to feed large, high trophic level fish... is more efficient than leaving small fish in the ocean to be consumed by wild predatory fish caught by fishermen... The relative efficiency of fish farming versus fishing is difficult to quantify, in part because energy transfer between trophic levels in marine systems is not well documented... capturing low trophic level wild fish for aquaculture feeds, with little concerns for the effect on higher trophic level wild fish, could form the basis for economically rational--although not ecologically sound--ocean management."

Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 24,
<http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

"Continued growth in marine aquaculture production could outstrip the current supply of fish used for fish meal and oil production, potentially jeopardizing the industry's economic sustainability." *Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 23,*
<http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

Evaluate the project's economic and environmental sustainability in light of the above statements.

Evaluate another alternative--the traditional Chinese approach of farming herbivorous or omnivorous fish to provide food for carnivorous farm fish.

Fish Farming Goes Back to its Roots, B. Roman, OnEarth online, 1-5-09, <http://www.onearth.org/node/819>

LACK OF OXYGEN

Evaluate whether there are seasonal anoxic (no oxygen) conditions at pen depth and evaluate any impacts on the fish.

CONTAMINANTS

Consider this background information--

"Antibiotics, pesticides, growth enhancers, and other drugs or chemicals used in these operations also can be damaging... Antibiotics can kill beneficial seafloor bacteria ... little is known about the long-term effects of aquaculture drugs." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

"Farmed fish can contain a variety of different chemicals and heavy metals. Kept in stationary cages in high numbers, farmed fish are more prone to disease and parasites, often requiring use of antibiotics and other substances. Furthermore, farmed fish are grown to be larger than wild fish and are given feed composed of highly concentrated, processed wild fish. Wild fish typically contain small amounts of mercury and other heavy metals. When they are processed into fish feed for farmed fish, the heavy metals become more highly concentrated, therefore increasing the levels of heavy metals in farmed fish who eat the feed. Taken at these levels, heavy metals could pose serious health risks to humans." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>*

"In the case of salmon, farmed fish contain higher levels of PCBs, dioxin, flame retardants, pesticides, and other toxins than wild fish because these contaminants are often present in the fish that are ground up for feed." *Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>*

Specify which of these substances will be used, in what amounts, and how often, both before fish are ready for the pen, and after they are in the pen--

Antibiotics--state whether they are the type used to treat disease in humans

Growth-enhancing substances

Other pharmaceuticals and drugs

Pesticides

Cleaning agents

Anti-fouling agents

Other chemicals

For all substances

Evaluate effects on farm and wild fish, and on people eating both

Evaluate effects on the ocean environment, from the substances entering the ocean directly, and/or in unconsumed feed, metabolic waste, and dead fish

Describe how farm fish will be tested for residues of the substances, and for PCBs, dioxin, flame retardants, pesticides, and heavy metals

Identify which government agencies monitor use of each substance. Describe the reporting system. Identify reliable funding sources.

For substances that will not be used, describe the monitoring plan to ensure they are not used, and identify reliable funding sources.

DISEASE

"Tuna health will be continuously monitored." DEIS p 2-11

Specify what type of government oversight is planned and who will pay for it.

"If disease should occur the affected tuna will be removed from the Oceansphere." DEIS p 2-11

Specify how workers will determine which fish are diseased and how they will catch individual fish.

Specify how diseased fish will be disposed of, in a manner that does not spread disease.

"Packed tightly fish rub against each other and the sides of their cages, damaging their fins and tails and becoming sickened with various diseases and infections." Wikipedia

Evaluate these risks and describe measures that will be taken to avoid them.

"In addition to sea lice from salmon farms, Whirling disease has spread from farmed to wild trout in more than 20 Northeastern and Western states. This parasite, which deforms and disorients young fish, has killed up to 90 percent of wild trout in some western U.S. streams.⁶ Disease transmission is a particularly difficult problem to assess and prevent, because very little is known about disease mechanisms among wild fish....Disease struck the University of New Hampshire's experimental fish farm several years ago, killing most of the entire stock of 200,000 juvenile cod, though apparently not entering the environment." Food and Water Watch website, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

Include this information in the EIS.

GENETIC ENGINEERING

Will the fish be genetically engineered? If so--

Evaluate impacts on wild fish from inevitable escapes

Evaluate health impacts on people who consume the fish, using independent, peer-reviewed studies not funded by industry

Evaluate whether Japan accept them. They don't accept GE papayas.

Specify how will consumers be informed that the fish are GE.

If plans change in the future to include GE fish, how will the public be notified?

GENETIC DIVERSITY

Will selective breeding be done? If so, evaluate impacts

Specify measures that will be taken to maintain genetic diversity.

"Limit stock to first generations" recommendation from Open Ocean Aquaculture: the Future for Florida and the Gulf of Mexico? Power Point by Marianne Cufone, vice chair of Gulf Council Offshore Aquaculture Advisory Panel
http://www.whoi.edu/cms/files/jmcdowell/2006/7/Cufone_Open_Ocean_Aquaculture_0306_12253.pdf

Will this recommendation be followed? If not, evaluate impacts.

ESCAPES

"About 1,500 of Kona Blue Water Farms'...fish were accidentally released...in early December, the company said today [January 4, 2009]...The fish escaped after a diver failed to fully close one of the fish pens..." Fish escape underwater cage off Keahole Point, Honolulu Advertiser,

1-4-08

How promptly will HOTI report escapes?

What measures will be taken to avoid human error causing escapes?

Evaluate impacts of escapes of gametes, embryos, eggs, and fish (early stages of selective breeding, genetically engineered, and/or diseased fish) in light of the following--

"Critics speculate that, since selectively bred and genetically modified fish may grow faster and larger than native fish, they could displace native fish in the short term...but might not be able to survive in the wild for the long term."
Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 11, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"The experience with salmon farming indicates that escaped fish could easily be a problem...through competitive displacement of native species." Congressional Research Service Report for Congress, Open Ocean Aquaculture, December 13, 2004, Borgatti and Buck, p. 11, <http://ncseonline.org/nle/crsreports/04dec/RL32694.pdf>

"Escapes of farmed salmon...are well documented...Numerous studies have documented the ecological damage caused by escaped farm fish...these may include reduced fitness of wild fish as a result of interbreeding...The impacts of fish escapes may not be recognized until they are irreversible..." Future seascapes, fishing, and fish farming, Goldberg and Naylor, Front Ecol Environ 2005; 3 (1) p. 24, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersin ecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

“... fish may escape from an aquaculture facility, whether nearshore or offshore, and interbreed with wild fish, potentially reducing the ability of wild fish to survive.” *Offshore Marine Aquaculture*, GAO report, May 2008. p. 2.

“Farmed fish are bred to grow fast and reproduce often. When these fish escape, they can disrupt the natural ecosystem by requiring more food than wild fish and by interbreeding with natural populations. Even though the farmed fish may be bigger and more aggressive, they also may be less fit for living in the wild because traits important to survive in farms are not the same as those needed in the wild. The farmed fish can pass on lower quality genes to wild fish, making the whole population weaker.” *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-farming/offshore/ocean-fish-farming-can-hurt-consumers-and-the-environment>

“About 2 million farmed salmon escape into the North Atlantic each year, equal to the number of wild fish there... In the first six months of 2007 alone, more than 100,000 Atlantic salmon escaped from four facilities on the west coast of Scotland. The incidents led a representative of one Scottish fishing group to recommend an outright end to open ocean aquaculture... Several years ago, thousands of fish escaped from Kona Blue Water Farms in Hawaii when a cage broke.” *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/new-technology-new-problems>

“Neither pens nor cages will prevent fish eggs from escaping.” *Future seascapes, fishing, and fish farming*, Goldberg and Naylor, *Front Ecol Environ* 2005; 3 (1) p. 24, <http://74.125.95.132/search?q=cache:c89szuKilssJ:www.frontiersinecology.org/specialissue/articles/Goldburg.pdf+future+seascapes+fishing+fish+farming+goldburg&cd=1&hl=en&ct=clnk&gl=us>

WASTE FROM FISH IN PEN

Opinions should be sought re. effects on the sea floor from the few scientists who have studied this subject for offshore fish farms in Hawai'i, even though their studies appear to be for shallower water than the HOTI project.

Include this information in analysis.

“Cates took over the operation [Cates International off O'ahu] from Charles Helsley, a long-time University of Hawaii researcher who in 1998 started the Hawaii Offshore Aquaculture Research Project, or HOARP... Helsley said when the seafloor near the cages was examined for adverse effects, ‘We saw nothing! No change at all... There was no significant change [in the seafloor ecosystem], as the media has so often reported as having occurred beneath salmon pens.’ In reality, worms associated with fecal pollution had appeared ‘rapidly’ and ‘became much more abundant under the net cage,’ according to Hawaii Pacific University’s Oceanic Institute.... In 2006, a research team reported that the facility had ‘grossly polluted; the seafloor and ‘severely depressed’ certain types of sealife. ‘Despite the open ocean location and alongshore currents, the effects of fish feed and waste on the [seafloor] community were evident.’ The ecosystem had been ‘drastically changed,’ they found, and the effects had spread beyond the area beneath the cages. In conclusion, the researchers wondered whether the seafloor could ever return to normal... Though he insists the operation hasn’t harmed water quality, Helsley has never tried to publish his data. ‘I am remiss in not writing up the water quality work,’ he said, explaining, ‘It is difficult to write up a negative result paper and get it published.’ *Food and Water Watch website*, <http://www.foodandwaterwatch.org/fish/fish-seafood/fish-farming/fishy-farms/life-in-the-industrial-aquaculture-facilities>

Note that Charles Helsley, founder of the Hawaiian Open-ocean Aquaculture Research Program, which found little change in benthos under the Cates International fish farm (see DEIS p. 2-54), was also in charge of that fish farm one point.

HOARP appears to have relied on a personal communication from Randy Cates, instead of actual photos, to say there was no visible change, seen in photos, of the seafloor. (Environmental Observations around Offshore Cages in Hawai'i, Charles Helsley, p. 3)

Include and analyze this information--

“... species diversity did not increase significantly during the [6-month] fallow period, indicating that the affected communities had not been fully restored to pre-culture or distant reference conditions...”

very few studies have investigated the effectiveness of... [the] ‘dilution solution’ [off offshore

sites] for farms operating at commercial-scale production rates...

The National Offshore Aquaculture Act of 2005...drew strong criticism for omitting proper legal safeguards against any environmental impacts...

It is possible that the environmental effects of organic enrichment can be mitigated by planned cessations in farming operations or rotational 'fallow periods' among multiple farming sites, net-pens or fish cages...Mandatory fallow periods have been instituted in Maine and Norway to 'break the life cycle' of fish parasites and diseases...

Bybee & Bailey-Brock 2003, Lee et al. 2006...documented reduced benthic invertebrate diversity, low oxygen levels in surface sediments and increased abundances of organic enrichment indicator species in locations closest to the commercial fish farm [in Mamala Bay off O'ahu]...

We provide evidence suggesting a partial recovery of previously degraded infaunal polychaete communities during the fallow period, as well as their sudden decline after farming operations resumed...

The difference in polychaete species diversity between reference and affected sites was not significantly lower during the fallow period in comparison with normal operational sampling periods....

...species diversity at the end of the 6 mo fallow period remained significantly lower below the fish farm at the affected site relative to a distant reference site...

The relative lack of change in community structure at these [reference] locations...indicates an absence of any major seasonal trends or natural succession patterns—a stark contrast to the affected community...

...at the end of the fallow period...evidence suggests a rapid return to earlier affected conditions...

Our study presents a unique case with an offshore aquaculture operation in relatively fast currents (30 to 50 cm s⁻¹)...

Partial recovery of infaunal communities during a fallow period at an open-ocean aquaculture, Lin and Bailey-Brock, Marine Ecology Progress Series, vo. 371: 65-72, 2008.

Include and analyze this information—

“Sediment samples collected directly below the fish enclosures were compared with sediment collected 300 m upcurrent. Total organic carbon was 25–37% higher in the control

compared with cage samples and ammonia was 30–46% higher in cage samples. Sulfate reducing bacteria (SRB) counts were 36% higher in cage sample sediments...

A mathematical model developed for prediction of organic material deposition suggests that while currents will reduce fecal loading and feed deposition beneath a cage, there is expected to be sufficient nutrient addition to impact those sediments. Time series or statistical information on the current field beneath the fish cages are needed to apply the model for predicting locations of high deposition. This would contribute to the development of a comprehensive monitoring program that would sample multiple locations over time to generate an accurate and comprehensive depiction of the environmental impacts of this new and expanding commercial endeavor....

In oligotrophic marine environments, addition of various nutrients through feed, detritus, and fecal matter can induce changes in the macro-, meio-, and microfauna community structure in the water column and sediment (La Rosa et al., 2001). Bacterial communities are especially sensitive to changes in the local environment. In sediments, studies have demonstrated that accumulation of large amounts of organic matter induce persistent changes in bacterial assemblages... Comprehensive characterization of microbial populations in regions adjacent to aquaculture operations are important indicators for the prevention and treatment of various diseases that can affect farmed fish stock, and for maintenance of water quality....

...there currently is insufficient information to draw any definitive conclusions. Since offshore mariculture is expanding in Hawaii, additional studies to identify and quantify impacts are warranted to ensure that facilities are sited, designed, and operated to maximize benefits and to minimize risks.”

*Impact of mariculture on microbial diversity in sediments near open ocean farming of *Polydactylus sexfilis*, Yoza, Harada, Nihous, Li, Masutani, Ecological Indicators 7 (2007) 108–122.*

Include and analyze this information--

“Regression analysis indicated significant decrease in Shannon-Weiner diversity over time and near the effluent source. Non-metric multidimensional scaling... showed a progression of species succession and turnover at impacted sites but

relatively unchanging polychaete communities at control sites. An analysis of similarity...indicated significant difference between community structures at impacted and control sites but less obvious differences over time. An abundant and regionally widespread polychaete...had disappeared from the impacted sites. Increasing abundances of 2 opportunistic polychaetes...resulted in decreasing Shannon-Weiner diversity values...at impacted stations...3 species [observed] may represent an order of succession due to attrition by anoxia...Deviation of the infaunal polychaete community at impacted sites...low species richness...and depressed community abundance reflect the effects of fish mariculture on the benthic community. Such effects may be diluted by the open-ocean location...

This study illustrates a change in macrobenthic community composition from a native assemblage to one dominated by indicator species in response to mariculture activity...

Oxidation-reduction potential...measurements at impacted sites were consistently lower than measurements at control sites...The difference between ORP measurement from control and impacted sites increased since the initial sampling...samples [from under the fish farm] had redox potentials consistently below the range of the meter used, which coincided with sulfuric odors detected by collectors. Such effects are not observed at other sites...

Anaerobic conditions may influence ecological dynamics of the benthic system....

[under the fish farm] evolved in to a grossly polluted site with a severely depressed polychaete community...The polychaete community found 80m down-current...followed, indicating that the footprint of effect had spread...to nearby environments...

[there was] little species turnover occurring in control sites compared to high species turnover in impacted sites....

The conclusions...indicate that the gradual buildup of organic detritus under the cage has drastically changed the infaunal community structure by displacing indicators of healthy benthic environments...with indicators of organic enrichment...

...the benthos [under the fish farm]...reached grossly affected conditions within 13 mo...the benthos [at a nearby site]...reached indicated heavily impacted conditions in 23 mo...

Despite the open-water location and alongshore currents, the effects of fish feed and waste on the benthic polychaete community were evident.”

Temporal changes in the polychaete infaunal community surrounding a Hawaiian mariculture operation, Lee, Bailey-Brock, and McGurr, Marine Ecology Progress Series, vol. 307: 175-185, 2006

Include and analyze this information--

“ammonia levels...tended to increase slightly...polychaete... became more abundant in the benthos directly underneath the cage than at control sites indicating a community response to increased organic load...” *Offshore Culture of the Pacific Threadfin...in Hawaii: Results of the Hawaii Offshore Aquaculture Research Project* Ostrowski et al. 2002

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Aloha Ms. Harden,

Thank you for your email of April 9, 2009 providing comments on the Hawaii Oceanic Technology Ahi Aquaculture Project. This letter is to provide responses to address your questions, while referring to the EIS Section where the issue is addressed.

At the beginning of your letter is a section entitled "SUMMARY" in which you list your general concerns about the project and pose some questions. Since all of these questions are included in the section entitled "Specific Comments," our responses will be provided for the questions in the "Specific Comments" section.

1. Evaluate the validity of research used for this DEIS in light of a quote from CRS 2004 report by Borgatti and Buck and a 2007 WHOI report regarding limited scientific research on aquaculture's effects on the marine environment.

The DEIS used the most up-to-date research and monitoring data from Kona Blue Water Farm, the closest and most comparable aquaculture operation, measuring impacts on water quality, biological resources including fisheries and protected species. Precisely because there is limited research done on the topic, Hawaii Oceanic Technology is prepared to carry out an on-going water quality monitoring program, providing the data to the State DOH. The details of this water quality monitoring program will be specifically proscribed in an NPDES Permit that the company will need to obtain from the State DOH. In addition, the company is prepared to carry out an on-going marine mammal monitoring program, providing data to DLNR DAR and NMFS, who will review and approve the protocol.

2. For any government grants, specify amounts, conditions, expiration dates, and plans for funding after grants expire.

Hawaii Oceanic Technology is privately funded and does not have any government grants.

3. Analyze whether statement re selling prices being twice as profitable in US mainland and Japan will still be true given future fuel prices, and future lowering of tuna prices when more tuna is available.

The statement regarding sales being twice as profitable on the US mainland and Japan is based on the company's business projections including estimated future shipping costs, as well as estimated future tuna prices. The company's methods are projected to have as few as one-tenth the fuel costs of long line boats which have to travel as far as 1,500 miles from Hawaii and stay out at sea for 2-3 weeks. This is very fuel inefficient compared to the planned operation of the Hawaii Oceanic Technology system.

4. Farmed fish are sometimes more flabby than wild fish. Will they still be sashimi-grade?

As stated in the EIS, the goal of Hawaii Oceanic Technology will be to produce sashimi-grade ahi. The technology was specifically designed in order to provide low stocking densities, constant temperature and sufficient space for the ahi to move, and to allow the Oceanspheres to be located in a deep open ocean area with strong pelagic currents. The quality of the fish that are produced in this aquaculture operation will be a superior product. The market will decide if it is a sashimi-grade product.

5. Compare nutrition levels and fat content of farmed and wild fish and specify how these will be publicized.

Wild ahi need to forage for their food and must eat as much as 15 lbs. for every pound of growth. Ahi grown in an aquaculture environment will be fed a food source that is specified by the company to have the right amount of protein, amino acids, lipids and Omega 3 and 6. Once the company is in production, we plan to conduct such a nutritional profile comparison and use the results in customer education and marketing.

6. How much of the profits will stay in Hawaii, and how much will go elsewhere?

Hawaii Oceanic Technology is owned by Hawaii-based private equity investors, venture capital funds based here and on the mainland and the co-founding members of the management team. Some shares are allocated for employees. The company will be reinvesting its profits for as long as necessary to support the full build out of this proposed project, and pursue additional licensing opportunities for the company's technology into the future. Any excess profits that are earned by the company in the future will be distributed on a basis to be decided by the Board of Directors at that time.

7. Evaluate the project's economic viability in light of numerous quotes regarding the profitability of Kona Blue Water Farm, several quotes from the 2004 CRS report and other sources on the rising costs for the industry, the difficulty of estimating profitability and securing financing for open ocean aquaculture, and the amount of government funding support for the industry.

Hawaii Oceanic Technology has studied the experience of other aquaculture operations, learning about the challenges and solutions they devised. The lessons learned by these other company's informed the technology design of the Oceanspheres as an untethered self-powered submerged open ocean aquaculture platform. As noted in the DLNR Division of Aquatic Resources comment letter on the DEIS, "there are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world." Based on these new designs, Hawaii Oceanic Technology is confident that its business model has the operational efficiencies and scale that help assure a successful outcome.

8. HOT will have 22 full time equivalent positions. How many will be full-time positions with benefits - health insurance, retirement, sick days, vacation, etc...?

The business plan includes 22 full time employees with benefits when the company reaches full build out of twelve Oceanspheres. The company plans to contract for a variety of services that will employ many others.

9. Estimate how many fishers will lose their livelihood as a result of the ahi farm, and how many of them will be hired by the farm.

No fishers are projected to lose their livelihood as a result of the ahi aquaculture project. The company has already received applications and calls from fishers and watermen anxious to be a part of the project. The cost of fuel and the lack of fish in Hawaii waters have had a terrible impact on local fishermen and related job categories. The company expects to change this situation and provide jobs where before there have been none.

10. Evaluate whether HOTI should post a bond in case it goes out of business, for disposal of the pens and all fish, work boats, and all dockside equipment and material.

Hawaii Oceanic Technology does not believe it necessary to post a bond for this purpose. Part of the Conservation District Use Permit would be a requirement that the ocean lease area would need to be restored to its original condition, which would include removal of the Oceanspheres from the ocean lease site. Sale of other company assets would follow standard procedures if the company went out of business. Such procedures are part of the company's operating agreement.

11. Specify how often the sphere will be checked, and by who, to ensure all the new technology is working as planned.

The crew of ten employees would be specifically trained and certified to operate the vessels, machinery, and specialized tools, on the ocean and under the water necessary for daily on-site maintenance. This crew would check each Oceansphere daily by use of remotely operated vehicles and cameras, and/or by raising the Oceansphere to the surface for a visual inspection and maintenance. A ground station will relay all data, images and video streams being transmitted from the system's telemetry module and will be observed 24/7 via a web based system.

12. Describe plans to retrieve the pen, protect human and marine life, protect natural resources and property, prevent fish escapes, and mitigate impacts of escaped and dead fish. If the pen moves out to sea, into the path of boats, or onto shore.

As noted in Section 2.10 on Emergency Services and Human Health and Safety, (p. 2-98 DEIS), it states that "In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology will contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be immediately notified via a required onboard transponder. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere to operational status however; a salvage company will be called in the event the work crew can't handle the problem.

As noted in the EIS Section 1.4 Description of the Proposed Action (p. 1-12 DEIS), "Free drifting 'subsurface' floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT professor, as per 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 which is neutrally buoyant. A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area (see Appendix C) 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 hours of failure by the 24/7 dispatch marine salvage company, such as the work boat the "Raven" operating out of Honokohau Harbor."

The Oceanspheres are specifically designed to minimize the potential for fish to escape from them. However, as these fish are first generation offspring from wild ahi caught in Hawaiian waters, there would be no effect on wild fish populations from any escaped fish since there is no genetic difference between the wild ahi and the ahi cultivated in the Oceanspheres.

13. Include comments from all relevant government agencies.

Please see the response above to comment #7 regarding comments from DLNR Division of Aquatic Resources. Hawaii State Civil Defense noted in their comment letter on the DEIS that, "After careful review of the Notice of Acceptance, Transmittal Letter and Response from Hawaii Oceanic Technology, Inc., Conservation District Use Application, and the Draft Environmental Impact Statement that have been provided, we feel that potential natural hazards have been acknowledged and that appropriate mitigation measures have been considered in preparing for any future incident." All the other comments from government agencies are included in the appendix to the EIS.

14. There should be enough data available on tsunamis and the damage they cause to greatly expand this evaluation (on p. 2-98)

As noted in the EIS Section 2:10 on Emergency Services and Human Health and Safety, "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 staff at the platform will be evacuated and removed from the danger zone if possible."

Tsunamis. The Oceansphere will operate in water depths of 1329 feet. Since waves break in water depths of one half its wavelengths, it would take a 2000 foot Tsunami to affect the Oceansphere within the Ocean Lease Site. Tsunami is "harbor wave" in Japanese, termed after

fisherman returning to their harbor after a day out fishing found their town destroyed by a tsunami, they had not detected it while out at sea outside the harbor. Because tsunamis have a long wavelength they only cause a small rise in sealevel as they pass a vessel out at sea, therefore the Oceansphere will not likely be affected by a "normal" sized Tsunami.

15. Identify who will make the evacuation/removal decision - project staff? Government officials?

The decision about evacuation will be made by the CEO of Hawaii Oceanic Technology in consultation with the Civil Defense and United States Coast Guard.

16. State whether "evacuated" means some or all of the fish will be released.

Evacuation refers to the company's employees and contractors working on the Oceanspheres. No fish are to be released.

17. Evaluate impacts assuming the pen existed during all tsunamis and alerts in the past 75 years that would have triggered evacuation.

Please see response to issue #13 and #14 above.

18. Evaluate whether there would have been time for evacuation and removal.

Please see the above response to issue #13 and #14.

19. Evaluate the impacts of the pen being lost at sea and all the fish escaping or dying in a tsunami.

Please see the above response to issue #12.

20. Specify what type and amount of insurance HOTI will purchase.

Hawaii Oceanic Technology does not currently have this specific information on type and amount of insurance it will purchase. But, the company plans to purchase whatever insurance that is required for its legal and responsible operation in the State waters of Hawaii. This would probably include general liability insurance, maritime insurance, and others.

21. State whether this (establishing a trust fund or bond requirement in case of bankruptcy, abandonment and unexpected damages) will be done, the \$ amt, and what organization will hold trust fund or bond.

Hawaii Oceanic Technology does not plan to set up a trust fund or purchase a bond since it is not required by the law to do so. The company will abide by all the conditions in the Conservation District Use Permit relating to liability. The company's articles of organizations specify liquidation preferences.

22. Specify security measures that will be taken to prevent vandalism and accidental damage from the public.

As noted in the EIS Chapter 1.0 Introduction section on Oceansphere Maintenance and Tuna Health Inspections, “The surface beacon will be equipped with warning lights and video cameras. If a boat should approach a warning message will be broadcasted to stay 100 feet from the beacon. If the boats continue to approach, a work boat will be dispatched from Kawaihae Harbor.” (p. 1-17 DEIS). The whole system both above and below water will be constantly monitored for a variety of conditions including video monitoring.

23. Explain the discrepancy between the DEIS quote that it would take two pounds of dry feed to produce one pound of growth of ahi, and the Borgatti and Buck quote that three to four pounds of wild fish is needed to produce one pound of farmed fish.

Other aquaculture operations do achieve the ratio of two pounds of feed to one pound of growth. This is not uncommon in the aquaculture industry. Fish feed will be formulated to our specifications and tested continually in order to achieve the highest FCR with the best outcome in terms of quality product.

24. Evaluate the project's economic and environmental sustainability in light of the quotes about the unsustainable reliance on wild stocks of baitfish to feed farmed fish.

The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which manufactures our feed to exacting specifications and is very transparent about their feed ingredients, processing. The company has already identified local alternatives for protein, lipids and Omega 3 and 6 fatty acids that can reduce impact on wild stocks. When they are up to capacity we will begin obtaining product from these sources.

25. Evaluate another alternative - the traditional Chinese approach of farming herbivorous or omnivorous fish to provide food for carnivorous farm fish.

This alternative is one that the company is very interested in pursuing as a means of producing sufficient quantities of fish meal locally to meet the company's demand of fish feed.

26. Evaluate whether there are seasonal anoxic (no oxygen) conditions at pen depth and evaluate any impacts on the fish.

In the DEIS section 2.4 on Water Quality, the Dissolved Oxygen levels at the surface, 50m depth, and 150m depth are similar (6.85 mg/l, 6.89 mg/l and 6.91 mg/l respectively). There is no documented evidence of any seasonal anoxic conditions at pen depth. Such conditions would be highly unlikely to form due to the pelagic waters and high currents in the proposed ocean lease site.

27. Considering selected quotes on farmed fish having more contaminants of antibiotics, PCBs, dioxin, flame retardants, pesticides, and other toxins than wild fish, specify which of these substances will be used, in what amounts, and how often, in hatchery and in the Oceansphere.

None of the listed chemicals are to be used in the feed or any other operations of the ahi aquaculture farm. Hawaii waters which are used in the hatchery and found at the proposed site do not contain

industrial pollutants such as those identified in your questions. This is one of the reasons Hawaii has ideal properties for farming a pure clean fish product. The environment in which the ahi is raised coupled with a feed that is specified by us and tested for purity of components will assure that such contaminants are not introduced into the diet of our animals.

28. for each substance, evaluate the effects on farm and wild fish, and on people eating both.

Since none of these substances will be used in the feed or operations of the ahi aquaculture farm, there will be no effects from these substances on the farmed and wild fish, and on people eating both.

29. Evaluate effects on the ocean environment, from the substances entering the ocean directly, and/or in unconsumed feed, metabolic waste, and dead fish.

Since none of these substances will be used in the feed or operations of the ahi aquaculture farm, there will be no effects from these substances on the ocean environment. Our systems are designed to be highly efficient and result in minimal to no excess feed entering the ocean. Mortalities will be removed on a daily basis using specially designed remotely operated underwater vehicles.

30. Describe how farm fish will be tested for residues of the substances, and for PCBs, dioxin, flame retardants, pesticides, and heavy metals.

Once the ahi aquaculture operation is producing ahi for sale, the product will be independently tested for contaminants to determine their quality and levels, if any, of substances cited in your question.

31. Antibiotics - state whether they are the type used to treat disease in humans.

If there is any disease or parasite detected in the ahi, the fish will be captured and sent to the UH Hawaii Institute for Marine Biology and/or the Aquaculture Development Program Disease Management Program. The treatment and protocol will be decided in consultation with these government oversight agencies.

32. Growth enhancing substances

Hawaii Oceanic Technology does not intend to use any growth enhancing drugs.

33. Other pharmaceuticals and drugs

Hawaii Oceanic Technology does not intend to use other pharmaceuticals and drugs.

34. Pesticides

Hawaii Oceanic Technology does not intend to use any pesticides.

35. Cleaning agents

Hawaii Oceanic Technology does not intend to use any cleaning agents which are not certified for use in the marine environment, and in aquaculture operations.

36. Anti-fouling agents

Hawaii Oceanic Technology does not intend to use any anti-fouling agents which are not certified for use in the marine environment, and in aquaculture operations.

37. Other chemicals

Hawaii Oceanic Technology does not intend to use any other chemicals which are not certified for use in the marine environment, and in aquaculture operations.

38. Identify which government agencies monitor use of each substance. Describe the reporting system. Identify reliable funding sources.

If any of these substances are to be used, it would need to be in consultation with HIMB and ADP Disease Management Program and the DLNR Division of Aquatic Resources. Hawaii Oceanic Technology is not familiar with the funding sources of the institutions, but is planning to pay for these services.

39. For substances that will not be used, describe the monitoring plan to ensure they are not used, and identify reliable funding sources.

All operations will use best management practices for health, safety and environmental protection to ensure quality control of the aquaculture ahi. Any substances of the nature described will not be used without specific advice and consent of regulatory agencies.

40. Specify what type of government oversight is planned and who will pay for it.

Please see the response to issue #38 above.

41. Specify how workers will determine which fish are diseased and how they will catch individual fish.

As noted in the EIS Chapter 1.0 Introduction section on Oceansphere Maintenance and Tuna Health Inspections, “Ongoing fish health will be monitored through a contract with Hawaii Institute of Marine Biology (HIMB), and/or the Disease Management Program of the Aquaculture Development Program in the Hawaii Department of Agriculture. Any fish mortalities retrieved from the Oceansphere will be sent to HIMB to determine cause of death. HIMB biologists are not expected to visit the Oceanspheres, HOT is committed to producing organic grade tuna. To maintain optimal health, the Oceansphere allows for a low stocking density, constant temperatures and access to plenty of clean pathogen free seawater. The tuna will be fed a well properly balanced diet prescribed for optimum health. However, if disease doses show up, the fish will be treated under the guidance of Hawaii Institute of Marine Biology pathologist, and/or the Disease Management Program of the Aquaculture Development Program in the Hawaii Department of Agriculture.”

42. Specify how diseased fish will be disposed of, in a manner that does not spread disease.

Please see the response to the issue #41 above. Disposal of the diseased fish will be guided by HIMB and/or the ADP Disease Management Program.

43. Evaluate the risks of fish disease in fish that are tightly packed, and describe measures that will be taken to avoid this problem.

Please see the response to issue #41 above regarding the design of the Oceanspheres allowing for a “low stocking density” as a means of reducing the risk of fish disease caused by overcrowding.

44. Include the information in the FEIS about sea lice in salmon farms, whirling disease spread from farm trout to wild trout, and UNH fish farm die-off

The concerns about sea lice in salmon farms and whirling disease spreading from farm trout to wild trout are examples of problems from aquaculture operations which are very different from the technology of Hawaii Oceanic Technology. The low stocking density and the ability to locate the operation in deep pelagic open ocean waters with constant predictable currents and temperatures will be key to avoiding the disease problems encountered by these other aquaculture operations.

45. Will the fish be genetically engineered? If so,

As described in the EIS, approximately seven tuna per year will be caught in waters off the Island of Hawaii and used as broodstock to produce fingerlings from eggs under contract to PACRC in Hilo. Based on this plan, all the fingerlings will be first generation offspring of wild brood stock and will not be genetically engineered.

46. Evaluate impacts on wild fish from inevitable escapes.

The Oceanspheres are specifically designed to minimize the potential for fish to escape from them. However, as these fish are first generation offspring from wild ahi caught in Hawaiian waters, there would be no effect on wild fish populations from any escaped fish since there is no genetic difference between the wild ahi and the ahi cultivated in the Oceanspheres.

47. Evaluate health impacts on people who consume the fish, using independent peer-reviewed studies not funded by industry.

Once the company is in production, we plan to conduct a nutritional profile comparison of the cultured ahi with wild ahi and use the results in customer education and marketing.

48. Evaluate whether Japan will accept them. They don't accept GE papayas.

Hawaii Oceanic Technology does not intend to genetically engineer the ahi.

49. Specify how consumers will be informed that the fish are GE.

Hawaii Oceanic Technology does not intend to genetically engineer the ahi.

50. If plans change in the future to include GE fish how will the public be notified?

Hawaii Oceanic Technology will need to comply with any and all provisions of the CDUP regarding this matter but has absolutely no plans to use GE fish.

51. Will selective breeding be done? If so evaluate impacts.

As noted in the response to #45 above, seven broodstock wild ahi will be caught in Hawaii each year. These broodstock will be selected for the healthy traits exhibited by the individuals so as to optimize the quality of the offspring. However, since all the broodstock will be in the same tank, spawning will involve any or all of the broodstock's genetic contributions which is similar in the wild.

52. Specify measures that will be taken to maintain genetic diversity.

As described in the EIS, approximately seven tuna per year will be caught in waters off the Island of Hawaii and used as broodstock to produce fingerlings from eggs under contract to PACRC in Hilo. Based on this plan, all the fingerlings will be first generation offspring of wild brood stock and the ahi that is produced will maintain genetic diversity.

53. Recommend limiting stock to first generations. Will this recommendation be followed? If not, evaluate the impacts.

Please see the response to #52 above.

54. How promptly will HOTI report escapes?

DLNR Division of Aquatic Resources will provide us with the protocol for reporting escapes.

55. What measures will be taken to avoid human error causing escapes?

The Oceanspheres are specifically designed to minimize the potential for fish to escape from them. The Oceanspheres will be brought to the surface for harvesting, so that the opening to the platform is located above the waterline, thereby reducing the risk of escape.

56. Evaluate impacts of escapes of gametes, embryos, eggs, and fish (early stages of selective breeding, genetically engineered, and/or diseased fish) in light of the following quotes on impacts of escaped fish on genetics of wild fish.

The Oceanspheres are specifically designed to minimize the potential for fish to escape from them. However, as these fish are first generation offspring from wild ahi caught in Hawaiian waters, there would be no effect on wild fish populations from any escaped fish since there is no genetic difference between the wild ahi and the ahi cultivated in the Oceanspheres. As noted in the response to the above issue #41 and #42, the diseased fish will be properly removed and dispatched to HIMB for analysis and final disposal.

57. Opinions should be sought re effects on the sea floor from the few scientists who have studied this subject for offshore fish farms in Hawaii, even though their studies appear to be for shallower water than HOTI project.

Benthic studies from Cates International moi farm and the Kona Blue Water Farm were used to understand the potential impacts of existing aquaculture operations. The design of this project is to solve any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center, "At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent."

58. Include in the FEIS an analysis using information from various quotes on impacts of aquaculture operations, such as the Cates International site, on the benthic environment (including Lee, et al 2006).

Please see the response to item #57 above.

59. HOARP refers to a 9 month recovery period for the benthos, instead of the 3-6 months previously observed. Is the recovery period longer if the pens are on -site longer?

Please see the response to item #57 above.

60. Evaluate environmental impacts from changes in species living under the HOT fish farm, when the farm is running continuously at full capacity, with no breaks for species to recover.

Please see the response to item #57 above.

61. Are effects still reversible after several years, and for what size fish farm?

Please see the response to item #57 above.

62. How large, frequent, and species-specific were increases beneath the platforms, compared to increases at control sites? (Ref DEIS p 2-40)

Please see the response to item #57 above.

63. One sample (taken 9-14-07 (p. 2-43)) is inadequate. Samples should be collected in several different seasons and several different weather conditions.

This sample is only intended to establish a baseline. The ongoing water quality monitoring program will provide a longer term data set. The specific water quality monitoring protocol will be determined by the DOH through the NPDES permit process.

64. Evaluate impacts from waste from fish pens in light of this quote from 2007 WHOI report re pollution impacts from a greatly expanded open ocean aquaculture industry.

Please see the response to item #57 above.

65. Specify what organizations will do the environmental monitoring, the type and frequency of monitoring, conditions that will trigger actions by HOTI and what type of actions, type of gov't oversight, and reliability of the funding source.

An independent environmental monitoring company will be contracted to do the water quality monitoring required of the project. The specific water quality monitoring protocol will be determined by the DOH through the NPDES permit process. The funding for the DOH is determined by the legislature and the State administration and the company has no control over this funding decision.

66. Evaluate how often currents carry materials back to the point of origin in the project area.

Please see the current study in Appendix B, which concludes on page 11 of the Current Study saying, "The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998)." (Lukas 2008, p. 11).

"Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture." (Lukas 2008, p. 11).

"Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton)." (Lukas 2008, p. 11).

67. Evaluate data from the former Ahi Nui fish farm off Kauai.

To our knowledge, there was no Ahi Nui fish farm off Kauai.

68. Evaluate impacts when weather or other factors prevent the daily cleaning. (Ref. DEIS p. 2-57)

If daily cleaning of the Oceanspheres is not done, then it can be assumed that there will be greater growth of algae and other sessile creatures on the top part of the Oceansphere. However, due to the fact that the top of the platform is 20 m below the surface, the algae growth will not be problematic even if daily cleaning is not possible.

69. What trash/debris will be generated and how will it be disposed of?

Any solid waste from operations that is produced in the operation will be brought back to shore and recycled or disposed in the County landfill.

70. Include in Final EIS a written agreement with the fish processing company re "encouraging beneficial use of the processing waste" (DEIS p. 2-72).

Such a written agreement will be part of a contract that will be negotiated with the fish processors after the CDUP and ocean lease are secured.

71. Describe alternatives, other than killing, to keep sharks and other predators from damaging the fish farm, and to protect employees, swimmers, and surfers from any sharks that are attracted.

The EIS discusses the alternatives, other than killing, to keep sharks from the aquaculture operation. These procedures are included in the "Shark Safety Plan" included in the EIS that would involve equipping the divers with nonlethal "shark pokers" to deter shark interactions. If anyone shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP Operations and/or the President. Prior to any further action, consultation with the DLNR DAR would be done to determine any baiting, hooking and/or tagging that would be done "to discourage the shark from visiting the area." (DEIS p. 2-67)

72. State how many sharks HOTI expects to kill and whether any are endangered.

Hawaii Oceanic Technology does not expect to kill any shark. None of the sharks in the area are considered endangered.

73. Describe the significance of sharks in native Hawaiian culture.

The EIS and the accompanying Cultural Impact Assessment state that to Hawaiians, sharks are considered a sacred animal, an aumakua or guardian spirit, and is considered a member of their ohana.

74. Include results of the study approved by the State legislature in 2005, if it was conducted.

We are not familiar with this study to which you refer.

75. Evaluate environmental sustainability of the project in light of the following quotes from FWW, Goldberg and Naylor 2005, and Cufone 2006

Hawaii Oceanic Technology has studied the experience of other aquaculture operations, learning about the challenges and solutions they devised. The lessons learned by these other company's informed the technology design of the Oceanspheres as an untethered self-powered submerged open ocean aquaculture platform. As noted in the DLNR Division of Aquatic Resources comment letter on the DEIS, "there are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion

systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world.” (See letter in the appendix).

The design of this project is to solve any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center, “At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent.” (Please see letter in the appendix).

76. State whether this training (from HIIWNMS re first response (DEIS p. 2-68)) will occur.

Training staff of Hawaii Oceanic Technology for first response to assist stranded marine mammals would take place if NMFS decides it is appropriate.

77. Specify what organization will supply observers (for marine mammals and sea turtles) and surveyors, how often will they work, and who will pay.

NMFS will determine the marine mammal monitoring program requirements regarding observers. This has not been completed at this time.

78. The Marine Mammal Monitoring Plan should be included in the EIS.

NMFS will determine the marine mammal monitoring program requirements regarding observers. This has not been completed at this time.

79. Does the farm plan to use sound devices to harass animals to keep them away. If so, evaluate the impacts.

Hawaii Oceanic Technology does not plan to use sound devices to harass animals to keep them away.

80. Evaluate effects on the humpback whale sanctuary one mile away.

As is noted in the EIS chapter 2.5 on Biological Resources section on humpback whales (p. 2-60 & 2-61 DEIS), the proposed site is at least one mile from the Hawaiian Islands Humpback Whale National Marine Sanctuary. “The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the near shore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small mesh platforms, there is no risk of entanglement by whales in the platforms.... The risk of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of Open Ocean in which the whales can maneuver around the platforms, the spherical shape of the platforms, and the depth at which the platforms are stationed.”

81. Evaluate effects of sucking up sea water. How will affect the benthic and pelagic marine life?

The current plans do not involve an OTEC pipe that will suck up seawater.

82. Will marine life become entangled in hoses?

As there are no loose lines as part of the deep water hose, there is no material to cause entanglement. The comment letter from the NMFS does not identify any entanglement issue with the hose. Current plans do not require a pipe to suck up seawater.

83. Analyze whether the project really has a smaller carbon footprint than the wild fish fishery when one includes the fuel use and carbon footprint from fish feed, construction, maintenance, transporting fish by air to markets, and breeding hatchlings

Such an analysis is not able to be completed now due to lack of information. However, this analysis will be done as the project progresses and more information is known about the source of fish feed, construction materials, target export markets, and inputs to the hatchery. This will be a useful analysis to do on an ongoing basis to work to reduce the carbon footprint of the aquaculture operation.

84. Expand the Region of Influence to evaluate how this project will affect fishers, communities hosting fish meal manufacturing, and the ocean ecosystem in areas outside Hawaii in light of the certain quotes on sustainability of baitfish fishery

Since Hawaii Oceanic Technology does not yet know the source of the commercial fish feed, and their source of fish meal, this analysis cannot be done at this time. The ROI for this EIS will remain the same and will not be expanded to areas used to provide fish meal. Hawaii Oceanic Technology will purchase commercially available fish feed, and sources of fish meal in this feed vary. Hawaii Oceanic Technology will provide transparency in terms of fish feed components and source. The company will also be working to replace imported fish meal with Hawaii grown fish for fish meal and fish oil.

85. Evaluate compliance with the CZMA, both to operate the open ocean site, and to transport staff, feed, and fish between the site and shore?

The proposed project complies with the provisions and guidelines contained in Chapter 205A where applicable. The relationship between the proposed project and the CZM program is discussed in the FEIS relating to Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection and Marine Resources.

The CZM objective and policies relating to Recreational Resources is to provide coastal recreational opportunities accessible to the public by protecting those coastal resources uniquely suited for recreational purposes, and providing adequate access and shoreline parks. This project does not interfere with coastal recreational opportunities.

The CZM objective relating to Historic Resources is to protect, preserve, and, where, desirable, restore those natural and manmade historic and prehistoric resources in the CZM area that are significant in Hawaiian and American history and culture. The policies are to identify and analyze significant

archeological resources, maximize information by preserving remains, and support state goals to protect, restore, interpret and display historic resources. This project complies with this objective through its analysis of cultural and historic resources in the proposed site and along the adjacent shoreline.

The CZM objective relating to Scenic and Open Space Resources is to protect, preserve and restore and improve the quality of coastal scenic and open space resources. The policies are to design and locate developments to minimize existing public views. This project is consistent with this objective and policy by siting its ocean lease site nearly three miles from shore so the visual impact is minimal.

The CZM objective relating to Coastal Ecosystems is to protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems. The policies include preserving valuable coastal ecosystems, including reefs, or significant biological and economic importance. The project's design enables the aquaculture operation to be located in deep water far from shore. Water quality modeling shows that there will be no negative impact on coastal ecosystems from this project. Impacts on fisheries are also minimized by the project site's distance from near shore fisheries and bottom fish fishing grounds.

The CZM objective relating to Economic Uses is to provide the public with public or private facilities and improvements important to the State's economy in suitable locations. The policies are to ensure that coastal dependent development are located, designed and constructed to minimize social, visual and environmental impacts on the coastal zone management area. This project is consistent with this objective and policy as an economic activity suitably located 2.6 nm from shore in state waters of 1,320 feet deep. This location has allowed the proposed project to minimize any negative social, visual or environmental impacts of the project.

The CZM objective of Coastal Hazards is to reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution. The policies are to control development in areas subject to coastal hazards. This project is consistent with this objective and policy since its location in 1,320 feet of water, 2.6 nm from shore is not subject to the damaging effects of such coastal hazards.

The CZM objective of Public Participation is to stimulate public awareness, education and participation in coastal management. The policies are to promote public involvement in the coastal zone management processes, and organize workshops on coastal issues and conflicts. This project is consistent with this objective and policies as shown by the community outreach and dialog it has undertaken in the local community as described in section 4.7 of the FEIS.

The CZM objective of Beach protection is to protect beaches for public use and recreation. This project is consistent with this objective by having no impact on beaches.

The CZM objective relating to Marine Resources is to promote the protection, use and development of marine and coastal resources to assure their sustainability. The policies are to ensure that the use and development of these resources is sustainable, and to coordinate the management of these resources to improve effectiveness. This project is consistent with this objective and policies as it are a sustainable use of Hawaii's ocean space and its fishery resources to grow fish in an environmentally-friendly way for local consumption and export.

86. Evaluate compliance with the Clean Water Act and NPDES, including Sec. 403(c), which requires special review for aquaculture facilities in offshore federal waters.

This project will apply for and obtain an NPDES permit after the EIS and CDUP are completed. The water quality modeling for the Zone of Mixing model shows that the project will comply with the water quality standards.

87. Evaluate compliance with Army Corps of Engineers requirements.

This project will submit an application for a Department of Army permit under Section 10 of the Rivers and Harbors Act. The design of the project complies with requirements of the Army Corps.

89. Evaluate compliance with the Magnuson-Stevens Fishery Conservation and Management Act

As this project proposes to capture approximately seven ahi annually to use as broodstock, and the fingerlings will be grown from wild-captured broodstock, this project is consistent with fishery conservation policies in the Magnuson-Stevens Fishery Conservation and Management Act.

90. Evaluate compliance with the Marine Mammal Protection Act

This project complies with the Marine Mammal Protection Act since it will not cause any harassment of marine mammals by noise, entanglement, or provisioning because the project's operations produce noise at levels well below the threshold that is determined to be harassment; the project does not have any loose nets or mooring lines; it uses hardened webbing material in the Oceanspheres; and the attraction of the Oceansphere to marine mammals is minimized by the design which allows divers to access the inside of the Oceansphere above water, thereby minimizing fish escapes and encounters between dolphins and divers.

91. Evaluate compliance with the Endangered Species Act

Since the endangered species that are relevant for this discussion are marine mammals or sea turtles, this project complies with the Endangered Species Act in the same manner as described above in question 90.

92. Evaluate compliance with the West Pacific Fishery Management Council recommendations

This project has been in consultation with officials of the West Pacific Fishery Management Council staff to ensure this project addresses the concerns and any relevant recommendations of the Council.

93. Evaluate compliance with the UN Convention on the Law of the Sea.

As this project is wholly within the waters of the State of Hawaii, which are recognized as waters under U.S. jurisdiction under the UN Convention on the Law of the Sea, then only U.S. and State laws have primacy. Since this project complies with relevant federal and state laws, then it is consistent with the UNCLOS.

94. Evaluate whether rent is fair market rent

The rent to be paid by Hawaii Oceanic Technology has not yet been determined by the DLNR.

95. Ceded lands are to be used for the benefit of the public. Explain how the project will benefit the public, in light of all the concerns raised in these comments.

Hawaii Oceanic Technology expects no significant adverse social and environmental impacts from this proposed operation. Beneficial economic impacts will result from job creation, technology development, and the production of a high-value export product, and has structured the venture to be environmentally sound, sustainable and in harmony with the natural environment and allied businesses in the State. The proposed action is consistent with the Hawaii State Plan related to economic development, agriculture, conservation lands, potential economic growth activities, and the physical environment of land-based, shoreline, and marine resources. The design of the proposed aquaculture operation without anchors and mooring lines, located three miles from shore in waters about 1,320 feet deep will help increase the economic activity in the aquaculture industry, provide local jobs in the marine-related and aquaculture-related fields, and avoid detrimental impacts on marine mammals, sea turtles, and other marine creatures, as well as avoid conflicts of use with fisheries, ocean recreation, cultural resource use, or other activities in the area. Anticipated taxable revenues will contribute to the State economy and according to the DBEDT economic multiplier 46 additional jobs will be created in the economy from the company's operations plus direct and contract jobs.

96. Evaluate the issue of privatization of the ocean in light of these statements from CRS 2004 report and 2007 WHOI report

This project is proposing to lease the ocean for the purposes of aquaculture as per the Hawaii Revised Statutes, Chapter 190D on Ocean and Submerged Lands Leasing. Privatization by virtue of the ability to lease a water column is consistent with and allowed by State law which was deemed to be an appropriate use of this vast open ocean resource.

97. Specify how often the Oceanspheres will be removed when not in use (DEIS p. 2-15)

The EIS Chapter 1.0 Introduction section on Oceansphere Maintenance and Tuna Health Inspections states that "Periodically, Oceanspheres will be disassembled at the ocean lease site and placed on a ship for transport to the maintenance site at Kawaihae Commercial Harbor for refitting before being redeployed. Any periodic repairs will take place on site. To disassemble the Oceansphere, the center stem will be attached to a line from an A frame from the work boat. Divers will disassemble the cage by unbolting the individual panels and stacking them on the deck of the work ship. The center stem will then be brought onboard the ship and the cold water pipe dissembled. The cage and the cold water pipe are modular design and area easily disassembled at sea." (DEIS p. 1-17).

98. Are all impacts evaluated for the maximum production of 6,000 tons/yr?

Yes, all potential impacts are evaluated based on the maximum production of 6,000 – 12,000 tons per year which will be determined on the basis of engineering efficiencies.

99. Evaluate impacts in light of these reports: Helsley; Goldberg and Naylor 2005; HOARP Phase II Final Report 2000; Oceana article, Yoza 2007, Ostrowski, et al 2002, Boratti and Buck (CRS) 2004; Lin and Bailey-Brock 2008; FAO report and Lee et al 2006

As noted in the response to issue #1 above, the DEIS used the most up-to-date research and monitoring data from Kona Blue Water Farm, the closest and most comparable aquaculture operation, measuring impacts on water quality, biological resources including fisheries and protected species. Precisely because there is limited research done on the topic, Hawaii Oceanic Technology is prepared to carry out an on-going water quality monitoring program, providing the data to the State DOH. The details of this water quality monitoring program will be specifically proscribed in an NPDES Permit that the company will need to obtain from the State DOH. In addition, the company is prepared to carry out an on-going marine mammal monitoring program, providing data to DLNR DAR and NMFS, who will review and approve the protocol.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', written over a printed name and title.

William A. Spencer
CEO

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Kanaka Council Moku O Keawe

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Testimony submitted by: Kale Gumapac, Alaka'i

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Re: COMMENTS ON DRAFT EIS for the AHI AQUACULTURE PROJECT
KOHALA COAST, HAWAII

(Declarations of Rights – 1840- by King Kamehameha III - Kingdom of Hawaii Constitution)

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR - 8 A 9:40
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

“God hath made of one blood all nations of men to dwell on the earth,” in unity and blessedness.

God has also bestowed certain rights alike on all men and all chiefs, and all people of all lands. These are some of the rights which He has given alike to every man and every chief of correct deportment; life, limb, liberty, freedom from oppression; the earnings of his hands and the productions of his mind, not however to those who act in violation of laws.

God has also established government, and rule for the purpose of peace; but in making laws for the nation it is by no means proper to enact laws for the protection of the rulers only, without also providing protection for their subject; neither is it proper to enact laws to enrich the chiefs only, without regard to enriching their subjects also, and hereafter there shall by no means be any laws enacted which are at variance with what is above expressed, neither shall any tax be assessed, nor any service or labor required of any man, in a manner which is at variance with the above sentiments.”

(1852- Art.I – Declared by King Kamehameha III of the Kingdom of Hawaii Constitution

“God hath created all men free and equal, and endowed them with certain inalienable rights, among which are life, and liberty, the right of acquiring, possessing, and protecting property, and of pursuing and obtaining safety and happiness.”

History shows that the rights of its people were protected by the Declaration of Rights of 1840 and again in 1852 by the Kingdom of Hawaii. It declared protection of their rights to both the Chiefly and native Tenant classes. These rights were not limited to the land, but included the right to "...life, limb, liberty, freedom from oppression; the earnings of his hands and the productions of his mind, not however to those who act in violation of the laws."

The Kanaka Council believes that throughout the history of the Hawaiian Kingdom these rights have not diminished and even the STATE OF HAWAII has a fiduciary obligation to protect all rights as stated under Article XII, Section 7 of the Constitution of the STATE OF HAWAII and House Bill 2895 Section 1 – ‘A Bill for an Act – Relating to Environmental Impact Statements.”

Article XII, Section 7. The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights. [Add Const Con 1978 and election Nov 7, 1978]

In reviewing the Draft Environmental Impact Statement (DEIS) there are substantial concerns that are not being addressed. We find that the current DEIS is not addressing all rights, culturally, religiously, customarily and traditionally, exercised by ahupua'a tenants who are descendants of the original land owners who inhabited these islands of Hawai'i prior to 1778.

The following issues not being addressed in the EIS are violations of the vested rights of the native tenants as recognized by the Kumulipo, Constitution of 1840, Kingdom of Hawai'i, and continued to be recognize by the Constitution of the State of Hawai'i in Article XII, Sec. 7.

The Kanaka Council finds the DEIS inadequate in relation to cultural, customary, traditional and religious rights and would like to have the following questions addressed and answered before the DEIS is approved.

1. How extensive was your search for Lineal heirs of the land, ocean and traditional, cultural, religious practitioners?
2. Where in the EIS does it show that State of Hawai'i has clear title to these ocean lands?
3. Where is the list of heirs belonging to these ocean lands of the project site?
4. Who gave Monty Richards the title "Konohiki"?
5. Who gave Pono Von Holt the title "Konohiki"?
6. What is your definition of cultural practitioner?
7. What is the psychological impact to the Kanaka Maoli?
8. Who made the determination that "Konohiki Fishing Rights" do not exist in the project area?
9. What other areas around kapae aina where Konohiki Fishing Rights do not exist?
10. Does the proposed project comply with the laws of the Kumulipo? If "yes" how? If "no" why not?
11. Who made the determination that fishing ko'a didn't exist in the project area?
12. How was that determination made?
13. How will the population wild fish population be affected by this project?
14. What steps will be taken to protect the religious rights of the Kanaka Maoli?
15. What habitat and nesting areas will be destroyed?
16. What ecosystem is created by this project?
17. Why does the cultural assessment in the EIS not address the po'e kanaka of today?
18. When will it be corrected?
19. Should native resources prior Western contact be protected?
20. How many islands have existing koa forests? Is there a need to protect it for the future?
21. What laws are written to protect endangered fish and sealife in Hawaii?
22. There is a lack of native Hawaiian input concerning the cultural assessment. Only a handful of Kanaka Maoli gave input but in the DEIS they were never asked their mana'o on the project. When will native input be taken?
23. How will the Kanaka Maoli benefit from this project?
24. Private land ownership does not give the landowner/lessee the right to harvest an endangered natural resource.
25. What gives a private corporation the right to create this type of project in the Kingdom of Hawai'i?
26. What Ahupuaa is in the project area?
27. What is meant by "sustainability"?
28. Why is it necessary for the project to provide fish for the rest of the world? Is that being sustainable?
29. Please explain why it's necessary for Hawai'i to suffer the negative environmental effects of increased pollution on the people and ocean in order for us to feed foreign investors?
30. Is the project area under a Royal Patent? Has clear title been established?
31. What is the impact to the wild fish population when fish escape from the cages?
32. When will a cumulative impact study be completed on present and future impact of the project?

33. What guarantees will be given that the fish meal from other countries will not be contaminated and will not wipe out their fish resources to manufacture the fish meal?
34. Is there any violation in cultural assessment that contradicts Article 12 Section 7 of the State Constitution?
35. What is the parameter of the project site?
36. How does a biologist do a cultural assessment?
37. What is the county responsibility to the protection of the ocean resource and clean water?
38. What is the role of the State of Hawai'i to protect the ocean resource and clean water?
39. What pollution problems will be caused by this project?
40. What is the estimated hazards of the project?
41. How many applications have been made on this project?
42. Were there other DEIS attempted only to have it withdrawn?
43. Who will be responsible for the oversight of this project? Will a Kanaka Maoli entity be contracted? How soon can a site visit be scheduled at the proposed user's expense?
44. How much fish will be reserved for Hawaiian use?
45. Has all pending violations against the parcel or project site been satisfied?
46. Has the previous owner and proposed owner been involved in other fish farm projects? Where? What references do they have?
47. Has there been a public hearing held on the island? If "no" when and where will it be scheduled?
48. What government funding are you receiving for this project? How much? Will you pay it back?
49. Clarify the issues and problems in the past regarding this project and/or type of project.
50. Were fishing and ocean practitioners notified of potential impacts on their gathering rights?
51. What companies will be providing the fish meal? What ties do they have to foreign countries where environmental and conservation laws are non existent?
52. Has the conservation plan with the NRCS and Hilo Soil and Water been created? Where is it?
53. How do you identify a cultural practitioner of the ocean?
54. Has ancient site assessments been made?
55. What steps are being taken to protect these areas?
56. Have the user done a cultural impact study of the area?
57. Who is the local fish meal source to provide fish food for the project?
58. What credentials do the cultural experts hired by the user have?
59. Are these experts cultural practitioners?
60. Will you extend the deadline on the DEIS for us to digest your answers when received and allow comment on the DEIS answers to our questions? review this 2000+ page document. Parts were missing from the DEIS
61. Has all tax obligations been met for the project site?
62. What is the proposed buffer for traditional gathering rights to fish around the cages?
63. What procedures are in place to guarantee transparency to review documents, reports and audits from the public?

The Draft Environmental Impact Statement for the proposed AHI AQUACULTURE PROJECT KOHALA COAST, HAWAII fails to provide adequate information and fails to answer critical questions. Your cultural assessment lacks credibility and truth. Monty Richards and Pono Von Holt are given Konohiki status when in fact they are not. Being a rancher does not qualify you to be a Konohiki. The Kanaka Council does not recognize the alphabet soup entities used to determine in the DEIS to qualify cultural sites and areas.

The Kanaka Council believes the State of Hawai'i is obligated to protect all rights as stated under Article XII, Section 7 of the Constitution of the State of Hawai'i and those positions that are stated in their response letter of the EIS. This is not a sustainable practice for Hawaii to export Ahi to markets throughout the world. This project will have a negative impact on Hawaii's Kanaka Maoli, kamaaina, malihini and the ocean environment in trying to feed the world. This mentality must stop.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Kale Gumapac". The signature is fluid and cursive, written over the typed name.

Kale Gumapac, Alaka'i
Kanaka Council Moku O Keawe

**Hawaii Oceanic Technology
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Kale Gumapac
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Aloha Mr. Gumapac,

Thank you for your letter of April 8, 2009 providing comments on the Draft EIS for the Ahi Aquaculture Project. This letter is to provide responses to address your questions, while noting the language in the EIS that addresses these matters.

On page 2 of your letter, you comment that: "In reviewing the Draft Environmental Impact Statement (DEIS), there are substantial concerns that are not being addressed. We find that the DEIS is not addressing all rights, culturally, religiously, customarily and traditionally, exercised by ahupua'a tenants who are descendants of the original land owners who inhabited these islands of Hawai'i prior to 1778."

On page 5 of your letter, you comment that: "The Draft Environmental Impact Statement for the proposed Ahi Aquaculture Project Kohala Coast, Hawaii fails to provide adequate information and fails to answer critical questions. Your cultural assessment lacks credibility and truth. Monty Richards and Pono Von Holt are given Konohiki status when in fact they are not. Being a rancher does not qualify you to be a Konohiki. The Kanaka Council does not recognize the alphabet soup entities used to determine in the DEIS to qualify cultural sites and areas."

Since these general comments and questions are also included in several specific comments/questions in your letter, our responses will follow each of your 63 questions:

1. How extensive was your search for lineal heirs of the land, ocean and traditional, cultural, religious practitioners?

The Cultural Impact Assessment was done following the "Guidelines for Assessing Cultural Impacts" adopted by the Hawaii Environmental Council in 1997. The methods and procedures used in the Cultural Impact Assessment are described in detail in Section 1.0. The biographic information on the people consulted is described in Section 2.0. The historical and cultural source material consulted is described in detail in Section 3.0.

The search for lineal heirs of the land and ocean was done by consulting the native Hawaiian kupuna in the area, searching historical documents in several state libraries, UH-Hilo Mookini Library, the records of the Royal Patents and Land Court Awards at the DLNR Bureau of conveyances, the title records at the Hawaii County Planning Department, the Hawaiian language newspapers in the Hawaiian Nupepa Collection at Bishop Museum. Excellent historical resource documents were found in the Bond Memorial library in Kohala, which were produced by the North Kohala Coastal Cultural Resource and Heritage Landscape Study done in 2005 by the UH Department of Urban and Regional Planning. This study included English translations of Royal Patents, Land Court Awards, Boundary Review Commission testimony regarding lands in Kohala, and two collections of Hawaiian historical stories:

the He Moolelo no Makalei, which was first published in 1928 in Ka Hoku O Hawaii, and Kohala Waho (leeward Kohala).

2. Where in the EIS does it show that State of Hawaii has clear title to these ocean lands?

Chapter 190D of Hawaii Revised Statutes regarding Ocean and Submerged Lands Leasing states in the section on Findings and Purpose that “Article XI of the constitution of the State of Hawaii relating to the conservation, control, and development of resources, provides in section 6 that the State shall have the power to manage and control the marine, seabed, and other resources located within the boundaries of the State, including its archipelagic waters, and reserves to the State all such rights outside state boundaries not specifically limited by federal or international law.” (HRS 190D-2)

The definition of “State marine waters” is also provided in the Ocean and Submerged Lands Leasing law as follows: “ ‘State marine waters’ means all waters of the State, including the water column, water surface, and state submerged lands, extending from the upper reaches of the wash of the waves on shore seaward to the limit of the State’s police power and management authority, including the United States territorial sea, notwithstanding any law to the contrary.” (HRS 190D-3).

3. Where is the list of heirs belonging to these ocean lands of the project site?

The project site is located in State marine waters. Please see the response to #2 above for more information on this.

4. Who gave Monty Richards the title "Konohiki"?

The researcher of the Cultural Impact Assessment was advised by William Akau, a kupuna and lifelong water man from the area to consult with Monty Richards as the head of Kahua Ranch, since they have had a general lease on thousands of acres of coastal land adjacent to the proposed ocean lease site for over eighty years. This lease was transferred to Ponoholo Ranch when the two ranches amicably separated in 1989. Pono Von Holt is the head of Ponoholo Ranch. Of the ahupua‘a in this area, all except one ahupua‘a are government land. The one ahupua‘a that is owned in fee is Ki‘iokalani ahupua‘a, which is owned by Kahua Ranch and Ponoholo Ranch. Because of this history with the land, William Akau suggested that Monty Richards and Pono von Holt could be considered the konohiki of the area. Please see the Cultural Impact Assessment and Chapter 2.11 of the EIS for more details on this.

5. Who gave Pono Von Holt the title "Konohiki"?

Please see the response to #4 above.

6. What is your definition of cultural practitioner?

As stated in the DEIS, cultural activities at the project site and the surrounding ocean area are primarily related to fishing. Though the proposed project site is not targeted for fishing, fishermen may transit the project area on the way from near shore fishing areas to offshore fishing areas primarily located to the south and southwest of the project site. Conceivably the area could be transited by those who are in a voyaging in a Hawaiian sailing canoe. Thus, for this project, a cultural practitioner in the ocean would include the native Hawaiian fishermen, such as Lala Laau and William Akau. The author of the Cultural Impact Assessment also interviewed long time fishermen who would be considered non-Hawaiian cultural practitioners, including Robert Cambra and Kwanji Fukuyama. On shore, cultural practitioners would include those who spend time camping, hiking, visiting cultural sites, fishing, gathering and praying on the shoreline. Thus, for this project, a cultural practitioner on the adjacent coastal land are the native Hawaiians who have used these coastal lands for generations, such as the

Ho'opai ohana and Michael Hanohano. The Hawaiian values of malama aina, "to take care of the land so it'll take care of you" have been the guide to those with the responsibility for stewardship of this land: Kahua Ranch and Pono Ranch. In this regard, Monty Richards and Pono Von Holt could also be viewed as cultural practitioners of malama 'aina.

7. What is the psychological impact to the Kanaka Maoli?

The Cultural Impact Assessment includes interviews with native Hawaiians who have used the ocean waters and adjacent coastal lands for decades. The EIS Sec. 2.11 on Cultural Resources notes that, "For the interviewees who camped and shore-fished along the shoreline adjacent to the proposed site, they were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews, each of them said it wouldn't affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the view shed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices, and beliefs of the coastal lands." (DEIS, p. 2-129)

8. Who made the determination that "Konohiki Fishing Rights" do not exist in the project area?

As described in the Cultural Impact Assessment and the EIS, "It's important to recognize that according to records of all registered fisheries in the office of the Territorial Surveyor, none were located off Ki'iokalani ahupua'a, or other ahupua'a in the Pu'u Ulaula region of North Kohala. So, there are no legal konohiki rights or registered fisheries in the area." (p. 2-116, DEIS). In addition, Murakami and MacKenzie describe the 1839 law passed by King Kamehameha III called "An Act to Regulate Taxes" in their book, Native Hawaiian Rights Handbook (1991, p. 175) saying that the konohiki, or overseers of ahupua'a...was given the right to regulate fishing in the waters adjoining his ahupua'a "from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach." (DEIS, p. 2-110). These two historical facts were the basis of the determination that there are no konohiki rights in the project area.

9. What other areas around kapae aina where "Konohiki Fishing Rights" do not exist?

The EIS addresses only the region of influence for the proposed project, which includes the proposed ocean lease area and the adjacent ocean waters. Other areas in the Hawaiian archipelago are outside the scope of the EIS. Please see the response to #8 for more information on konohiki rights.

10. Does the proposed project comply with the laws of the Kumulipo? If "yes" how? If "no" why not?

The Kumulipo is a very important cultural resource, and references to these Hawaiian creation stories is included in the Cultural Impact Assessment. But, neither Chapter 343, Hawaii Revised Statutes nor the Office of Environmental Quality Control EIS guidelines require the EIS document to consider the Kumulipo in the EIS section 3.0 entitled "Conformance with Public Plans and Policies."

11. Who made the determination that fishing ko'a didn't exist in the project area?

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this area for

many decades were interviewed: Eddie “Lala” La’au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko‘a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

12. How was that determination made?

Please see the response to #11.

13. How will the population wild fish population be affected by this project?

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko‘a, and ono trolling lane (2.0 to 2.6 nm) and the depth of water (1,320 feet). The Oceanspheres are expected to act as a Fish Aggregating Device, and would attract some species of fish, such as ono and mahimahi.

14. What steps will be taken to protect the religious rights of the Kanaka Maoli?

We respectfully wish to support the rights of native Hawaiians to customary religious practice. However, since there was no evidence, anecdotal or historical, or any religious practices at the project site, no additional steps will be taken in this regard. Please see the Cultural Impact Assessment Section 4.5 for more information on this topic.

15. What habitat and nesting area will be destroyed?

As described in the EIS in section 2.5, there will be no habitat or nesting area destroyed.

16. What ecosystem is created by this project?

As described in the EIS in section 2.5, there will likely be fouling growth of marine benthic fauna on the platforms and associated apparatus. “This 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 plankton. No measurable impacts are expected on the adjacent communities. The presence of these organisms would primarily be a function of the presence of the artificial substrates, rather than any other perturbation of the environment.” (DEIS p. 2-58).

17. Why does the cultural assessment in the EIS not address the po‘e kanaka of today?

The Cultural Impact Assessment interviews individual native Hawaiians who are currently cultural practitioners with personal knowledge of the area because of a lifetime of work on the water (former Kawaihae Harbormaster William Akau and opelu fishermen Lala La’au), or on the adjacent coastal lands for camping, fishing, and carrying out other cultural practices (Kimo, Bernard and Leina‘ala Ho‘opai, Michael Hanohano). Please see section 2.0 of the Cultural Impact Assessment for a description of these individuals.

18. When will it be corrected?

Please see the response to #17.

19. Should native resources prior Western contact be protected?

The Cultural Impact Assessment notes the historical information on native resources dating from before Western contact. There are no historic sites recorded in the proposed ocean lease site. This was

confirmed by the State Historic Preservation Division in their letter commenting on the DEIS. This letter is included in the Final EIS.

20. How many islands have existing koa forests? Is there a need to protect it in the future?

Since this EIS is to focus on the proposed ocean lease site, and the adjacent coastal lands, it is outside the scope of this EIS to evaluate how many islands have koa forests and what should be done to protect them.

21. What laws are written to protect endangered fish and sea life in Hawaii?

Such laws are contained in the Hawaii Revised Statutes Chapter 187A on Aquatic Resources.

22. There is a lack of native Hawaiian input concerning the cultural assessment. Only a handful of Kanaka maoli gave input but in the DEIS they were never asked their mana`o on the project. When will native input be taken?

Please see the response above for #17.

23. How will the Kanaka Maoli benefit from this project?

In the section on Environmental Justice in the EIS (see Section 2.9 on Socioeconomic Conditions), it notes that, "Beneficial impacts are expected on minority and low-income populations as a result of the Proposed Action, as new jobs will become available at all educational levels. Local contractors will benefit from new business as well." Native Hawaiians are expected to benefit in this manner.

24. Private land ownership does not give the landowner/lessee the right to harvest an endangered natural resource.

This project is proposing to lease the ocean for the purposes of aquaculture as per the Hawaii Revised Statutes, Chapter 190D on Ocean and Submerged Lands Leasing. The proposal is to grow ahi, which is not an endangered animal.

25. What gives a private corporation the right to create this type of project in the Kingdom of Hawaii?

Please see the response above to #24.

26. What Ahupua'a is in the project area?

As described in the EIS and Cultural Impact Assessment, 'The coastal region east and closest to the Proposed Action site is Malae Point and the area around it. Malae Point is the boundary of two ahupua'a: Kaihooa and Ki'iokalani. (DEIS p. 2-112)

27. What is meant by "sustainability"?

According to the American Heritage Dictionary (Houghton Mifflin Co. 2009), "sustainability" is the noun form of the word "sustainable," which means, "capable of being continued with minimal long-term effect on the environment."

28. Why is it necessary for the project to provide fish for the rest of the world? Is that being sustainable?

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. While some ahi produced in the aquaculture operation will be sold in the local market, the target market for the ahi is in Japan and the U.S. west

coast because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the company's employees and investors which are based in Hawaii.

29. Please explain why it's necessary for Hawaii to suffer the negative environmental effects of increased pollution on the people and ocean in order for us to feed foreign investors?

The DLNR has made a determination that there is a "Finding of No Significant Impact" since there is no indication that there will be negative environmental effects of increased pollution. More than 50% of the investors in this project are from Hawaii. There are no "foreign investors". A sustainable supply of ahi could be provided to the local population if requested.

30. Is the project area under a Royal Patent? Has clear title been established?

As described in the EIS, there is no Royal Patent for the project area. Title to these ocean lands is with the State of Hawaii. For more information, please see the response above to #2.

31. What is the impact to the wild fish population when fish escape from the cages?

The Oceanspheres are specifically designed to minimize the potential for fish to escape from them. However, as these fish are first generation offspring from wild ahi caught in Hawaiian waters, there would be no effect on wild fish populations from any escaped fish since there is no genetic difference between the wild ahi and the ahi cultivated in the Oceanspheres.

32. When will a cumulative impact study be completed on present and future impact of the project?

The cumulative impact analysis was done as part of the EIS and is presented in Sec. 2.1.5.

33. What guarantees will be given that the fish meal from other countries will not be contaminated and will not wipe out their fish resources to manufacture the fish meal?

The fish feed proposed to be used in the operation is pelleted fish feed. According to comments from the UH aquaculture expert, "It is probably not necessary to have pelleted diets used for grow out inspected for pathogens as that is currently not done." (UH Environmental Center letter included in the EIS). However the company will test all imported fish meal and have independent testing done as well. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will specify the exact feed formulation to be used by a feed company which is very transparent about their feed ingredients and processing techniques. The company will also seek to identify local alternatives for protein, amino acids and fatty acids such as Omega 3 and 6 to supplement imported fish meal.

34. Is there any violation in cultural assessment that contradicts Article 12 Section 7 of the State Constitution?

Hawaii Oceanic Technology is not aware of any violation of the Hawaii State Constitution section on "Traditional and Customary Rights." Please see for more information on the extent of ahupua'a tenant rights in the proposed ocean lease site

35. What is the parameter of the project site?

As shown in the EIS on Figure 1-3, the proposed project site is located approximately 2.6 nm. Offshore Malae Point in North Kohala. The site consists of one square kilometer, and is centered at 20°05' 40.090" N 155°55' 40.00" W.

36. How does a biologist do a cultural assessment?

The author of the Cultural Impact Assessment is a planner with expertise in coastal and marine resources. His training is in both social and natural sciences, and he has extensive local experience in ethnographic studies, oral histories, and historical research.

37. What is the county responsibility to the protection of the ocean resource and clean water?

Chapter 205A (Hawaii Revised Statutes) delegates authority to the counties over the Special Management Area (SMA) of the coastal land. Inasmuch as the coastal land-based activities may affect near shore waters, SMA permit conditions may include measures to reduce polluted runoff from the land into the ocean, as well as water quality monitoring programs.

38. What is the role of the State of Hawaii to protect the ocean resource and clean water?

State laws to protect ocean resources are contained in the Hawaii Revised Statutes Chapter 187A on Aquatic Resources. State regulations to protect ocean water quality are contained in Hawaii Revised Statutes Chapter 342D on Water Pollution and Hawaii Administrative Rules 11-54 on Water Quality Standards.

39. What pollution problems will be caused by this project?

As described in the EIS Sec. 2.4 on Water Quality, there are projected to be less than significant impacts on water quality from the proposed project. "Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes' metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (see appendix Current Study Report), constant mixing of the SML, placement of platforms at 180 feet (55 meters) depth, 3-mile (2.6 nautical mile) distance from coral reefs and 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.

The best examples of likely impacts on water quality are drawn from the studies of the OOA research projects and water quality monitoring from the subsequent commercial moi operation off 'Ewa Beach, O'ahu, (CII) as well as the water quality monitoring program of the cages 0.5 mile offshore off Keahole Point for KBWF (KBWF 2003). The broad conclusions drawn from these studies are that the tremendous dilution factor of the water moving through these deep-water OOA platforms greatly reduces the impacts on the water quality downstream of the operation." (DEIS p. 2-40).

"Given the distance from land and depth of water, the strict standards for water quality for oceanic waters, the high volume of water moving through the site quickly diluting excess nutrients, and the high variability of natural concentrations of nutrients due to cyclonic eddies (see Current Study Report), the proposed project is expected to have a less than significant impact on water quality in the ROI.

40. What is the estimated hazards of the project?

The hazards of the operation to the staff, to the public and to the environment are discussed in the EIS in Section 2.10 on Emergency Services and Human Health and Safety (p. 2-98 DEIS). "All Hawaii Oceanic Technology employees working at the fish platforms will be trained, certified, and experienced as appropriate to their tasks. A health and safety plan will be developed for all open ocean activities. The addition of an estimated 22 employees would not place a significant additional strain on existing emergency services given the substantial amount of recreation and other commercial activities that already occur within the ROI.

In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology will contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be immediately notified. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere however; a salvage company will be called in the event the work crew can't handle the problem.

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 staff at the platform will be evacuated and removed from the danger zone if possible.

The primary affect of a Tsunami is in harbors and near shore environments, not in Deep Ocean where the affect is essentially a wave of negligible proportion. This is while ships in harbor will move off shore so as not to be affected by a Tsunami.

41. How many applications have been made on this project?

On January 30, 2009 DLNR accepted a complete Conservation District Use Application. This was the only complete CDUA that was submitted to the DLNR by Hawaii Oceanic Technology.

42. Were there other DEIS attempted only to have it withdrawn?

There was only one Draft Environmental Impact Statement submitted to DLNR, which was published by OEQC on February 23, 2009.

43. Who will be responsible for the oversight of this project? Will a Kanaka Maoli entity be contracted? How soon can a site visit be scheduled at the proposed user's expense?

The project management team consists of Bill Spencer, CEO and Paul Troy, CTO. There will be many different contracts for different services. Native Hawaiian businesses will be most welcome to submit contract bids when the requests for bids is released. We will make every effort to inform the different relevant businesses to solicit their bids. Site visits will be arranged when contractors are selected.

44. How much fish will be reserved for Hawaiian use?

The fish that will be produced will be owned by Hawaii Oceanic Technology and sold on a wholesale basis to any potential buyer, including those of Hawaiian descent. If any buyer wants a certain amount of fish reserved for their purchase, the company will be more than willing to accommodate these requests on a case by case basis.

45. Has all pending violations against the parcel or project site been satisfied?

Hawaii Oceanic Technology is not aware of any pending violations against the proposed ocean lease area.

46. Has the previous owner and proposed owner been involved in other fish farm projects? Where? What references do they have?

Hawaii Oceanic Technology is proposing this project. There is no "previous owner" and "proposed owner" in this project. The ahi aquaculture project is the first aquaculture project proposed by Hawaii

Oceanic Technology, itself. The shareholders of the company include various private equity investors and members of the management team who have not been involved in "other fish farm projects." For expertise and experience in aquaculture, the company is contracting with various experts in aquaculture for work on the project.

47. Has there been a public hearing held on the island? If "no" when and where will it be scheduled?

Yes, the public hearing was held on April 14, 2009 in Kawaihae.

48. What government funding are you receiving for this project? How much? Will you pay it back?

Hawaii Oceanic Technology has not received any government funding for this project.

49. Clarify the issues and problems in the past regarding this project and/or type of project.

This proposed project has had no issues or problems in the past. All the different components of the technology have been used for years in open ocean applications. But, this is the first project that combines all these different components as an untethered self-powered deep-water submerged aquaculture platform. So, there is no history of issues or problems.

50. Were fishing and ocean practitioners notified of potential impacts on their gathering rights?

As part of the Cultural Impact Assessment, the researcher informed the fishing and ocean practitioners of the proposed project. The issue of exclusion from the area was discussed at length. It was this discussion that resulted in the decision by the company to reduce the exclusive zone from what was previously proposed, and allow fishing as close as 100' of the buoy that marks each Oceansphere.

51. What companies will be providing the fish meal? What ties do they have to foreign countries where environmental and conservation laws are nonexistent?

Hawaii Oceanic Technology is unable to answer that question at this time. We have not yet selected a company to supply the fish feed. We will select a company with a strong reputation for transparency in terms of its components and suppliers. We are very sensitive to this issue of the sustainability of the fish meal and will use this as a major criteria in selection of a feed supplier who can manufacturer fish feed for the project according to the company's exact specifications.

52. Has the conservation plan with the NRCS and Hilo Soil and Water been created? Where is it?

Hawaii Oceanic Technology is proposing the project to be located 2.6 nm offshore Malae Point in North Kohala in 1,320 feet of water. The NRCS and Hilo Soil and Water are not involved in any way in this proposed ocean lease area. Consequently, there is no such conservation plan for this project.

53. How do you identify a cultural practitioner of the ocean?

Please see the above response to #6.

54. Has ancient site assessments been made?

As part of the Cultural Impact Assessment, a search of the National Register of Historic Places was done, which identified nothing on the proposed ocean lease site. This was confirmed in a letter by the State Historic Preservation Division in their DEIS comment letter (see appendix).

55. What steps are being taken to protect these areas?

Please see response to #54.

56. Have the user done a cultural impact study of the area?

A cultural impact assessment was done as part of the EIS.

57. Who is the local fish meal source to provide fish food for the project?

Please see the response above to #33.

58. What credentials do the cultural experts hired by the user have?

The only cultural research that has been done for the company has been the Cultural Impact Assessment. The author's credentials are described above in the response to #36.

59. Are these experts cultural practitioners?

The author of the cultural impact assessment is very knowledgeable about historic and current fishing practices in the Hawaiian Islands. Being a practitioner himself was not part of the job description for someone to prepare a Cultural Impact Assessment.

60. Will you extend the deadline on the DEIS for us to digest your answers when received and allow comment on the DEIS answers to our questions? Review this 2000+ page document. Parts were missing from the DEIS.

The DLNR has informed the company that the public comment period for the DEIS ended on April 9, 2009. The DEIS document is 342 pages, not 2000+ pages long. There were no parts missing from the DEIS as posted on the OEQC website. DLNR has given all statutorily required notices necessary for public input into this process.

61. Has all tax obligations been met for the project site?

The company is not aware of any tax obligations that have not been met for the project site.

62. What is the proposed buffer for traditional gathering rights to fish around the cages?

All fishermen will be allowed to fish around the Oceanspheres, but not above them or below them. All boaters are asked to keep 100' away from the surface marker buoy of each Oceansphere.

63. What procedures are in place to guarantee transparency to review documents, reports and audits from the public?

The company will follow all legal requirements to disclose information to the government and public.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,



William A. Spencer
CEO

Hawaii Oceanic Technology, Inc.

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Joseph A. Carvalho
PO Box 776
Kapaau, HI 96755
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Bill Spencer
Hawaiian Ocean Technology
Fax 528-4751

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dawn Hager
DLNR
Fax 587-0322

George Redpath
Tetrattech
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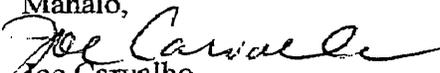
Aloha,

Mahalo for letting me comment on the EIS for the Hawaiian Ocean Technology ahi aquaculture system. I am fully in agreement that new food sources is a necessity because of the growing world population, however, your target for food production seems to be for the upper classes of Japan and California.

In addition, North Kohala recently had their Community Development Plan adopted the Hawaii County council and signed by at the time Mayor Kim. Because your globes will be just outside North Kohala shores, I do not recall any public meetings to apprise the community what your project is all about. What fishing impact will there be for local trollers, what happens to the waste besides theoretical assumptions, how fast can the globes recover from drifting outside their areas and what is the impact for the shoreline fishery?

If your project is approved as it appears, community meetings in North and South Kohala regarding your project is essential.

Mahalo,


Joe Carvalho

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

Joe Carvalho
P.O. Box 776
Kapaau, HI 96755

Aloha Mr. Carvalho,

Thank you for your letter dated April 6, 2009 providing comments on the Hawaii Oceanic Technology Ahi Aquaculture Project.

In your letter, you provide a series of comments and some specific questions. This letter will provide a response to each question. Your question or comment is summarized first in bold face font. Then, in regular font following each question, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. I am fully in agreement that new food sources is a necessity because of the growing world population, however, your target for food production seems to be for the upper classes of Japan and California

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the company's employees and investors who are based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company is sensitive to its impact on the livelihood of local fisherman. Hawaii imports 80% of the seafood we consume and we also import high quality ahi to Japan and the US Mainland. Initially the company plans to market its farmed ahi in Hawaii primarily for branding and brand awareness purposes. If additional supplies are required or requested, supplies can be made available.

2. N. Kohala has Community Development Plan.

Hawaii Oceanic Technology recognizes that North Kohala has a Community Development Plan. On page 3-5 of the Hawaii Oceanic Technology Draft EIS is the analysis of the project's compliance with the North Kohala Community Development Plan. It is quoted here:

3.2.2 North Kohala 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 (CDP) was approved by the Hawaii County Council. The North Kohala CDP does not specifically include the ocean area, since the ocean is not under County General Plan jurisdiction. However, the CDP does include some references that could relate to the proposed project, especially related to protecting view planes of the ocean from land, protecting the coastal lands adjacent to the proposed ocean lease site, and promoting agriculture.

According to the North Kohala CDP,

*The over-arching **Goal** for achieving the desired **Growth Management** in Kohala is summarized as:*

GOAL: Direct North Kohala's growth to areas within and near existing town centers in order to preserve the district's open space and cultural resources; and to promote agriculture.

There are nine strategies to implement the over-arching Goal. Of these, two relate to the proposed action:

Strategy 1.4: Promote and Support a Community of Diversified Agriculture

Strategy 1.9: Establish a View Plane Protection Program to identify and protect areas of significant beauty along the Kohala Mountain Road and Akoni-Pule Highway corridor. (North Kohala CDP: 27

Under Strategy 1.4, related to agriculture, the relevant goal is that "...the Kohala community will produce 50% of the food it consumes." (North Kohala CDP, 2008: 134).

The Proposed Action is consistent with this strategy by increasing the amount of ahi that is produced locally that is consumed locally. Though the main markets for the cultured ahi tuna are the US west coast and Japan, there will be some ahi sold on the local market. So, the Proposed Action is consistent with the strategy by increasing local production of locally-consumed ahi.

Under Strategy 1.9 related to view plane protection, the CDP says the North Kohala CDP Action Committee will

- *identify view planes of significant beauty along the Kohala Mountain Road and Akoni-Pule Highway; and*
- *Identify potential programs and regulations to protect the view planes from development and/or encroachment (North Kohala CDP: 39).*

The coastal area adjacent to the proposed ocean lease site is identified in the North Kohala Environmental and Cultural Concept Map as having "a high concentrations of cultural sites" on the maps of the North Kohala CDP (North Kohala CDP: 25).

The company recognizes that the view plane from the Akoni-Pule Highway of the ocean area where the proposed ocean lease is located would be considered a view plane of significant beauty.

Relating to public access, the lands at Ki'iokalani, Puaiki and Puanui were identified as mauka-makai access roads to the coastal trail. This was part of the long-range access plan of a coastline trail from Polulu to Kawaihae, and drivable mauka-makai access roads. In the recommendations for the mauka-makai access roads was the following:

Puanui, Puaiki and Ki'iokalani ahupua'a – vehicular access on an existing jeep road over State land and Ponoholo Ranch, Ltd. Land TMK 5-9-03 to Māla'e Point. Also over Kamehameha Schools land TMK 5-8-01:8 to Wawaionu Bay." (North Kohala CDP: 53).

This recommendation as a site for mauka-makai access also reflects the public value of the view planes from the coastal land adjacent to the proposed ocean lease site.

The Proposed Action is consistent with view plane protection in this area because the additional work vessels and visible tops of the Oceansphere for 4 hours/day are not anticipated to cause a noticeable impact on the view plane from shore. It was noted by those interviewees using the coastal lands adjacent to the proposed ocean lease site that the distance from shore resulted in the proposed project having no impact on the view shed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. The addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho'opai 2008, Hanohano 2008, Akau 2008).

With this conclusion in mind, the Proposed Action is consistent with the view plane protection strategy of the North Kohala CDP.

3. I don't recall any public meetings to apprise the community what your project is all about.

The scoping process for the DEIS included numerous meetings with the public and relevant government officials. On September 5, 2006, the company had meetings with relevant government agency officials. In February 2007, the company had additional meetings with DLNR, DOH and DOA. On July 16, 2008, the company had a follow-up meeting with government agency officials. Community meetings that served to help develop the scope of the EIS were held on April 23, 2007 at the meeting of the West Hawaii Fishery Council, and on August 3, 2008 at a meeting in Kawaihae of the Kawaihae Local Resource Council. Another public meeting was recently held in Kawaihae at the Kawaihae Local Resource Council on April 5, 2009, and a public hearing was held in Kawaihae on April 14, 2009. Other meetings with public agencies, other community organizations, and community members are summarized in Figure 4-1 on p. 4-4 of the DEIS.

4. What fishing impact will there be for local trollers and the shoreline fishery?

An analysis was done on the potential impact of the project on the shoreline fishery, as presented on page. 2-59 of the DEIS:

While the proposed site is about a mile away and in waters 300 feet deeper than the deepest waters targeted by bottom fish fishermen (Fukuyama 2008), and in waters about 400 feet deeper than the bottom fish designated habitat area of particular concern, fishers interviewed expressed concern about the potential impact of the Oceansphere platforms on the distribution of bottom fish (Fukuyama 2008, Cambra 2008). They felt it would have an adverse impact on the bottom fish fishery.

To address this concern, analysis was done of the evidence of impacts on the benthic environment at the two existing aquaculture sites, which occur in less than 200 feet (61 meters) of water, which suggests no major change in the diversity of benthic organisms. If these sites, occurring in 200 feet (61 meters) of water, show minimal impact on the benthic habitat, it is surmised that the potential impact on the seafloor at the proposed site (1,320 feet [402 meters]) depth is as slight as to be not quantifiable. In addition, a water quality model was used to determine at what point ambient levels will be reached for water quality parameters. The zone of mixing model shows that by 150 meters below the surface where the Oceansphere is located, water parameters are at ambient levels. See the

section above on water quality for more information. Based on these analyses, the impact of the Proposed Action on bottom fish is anticipated to be less than significant.

There is also recognition by these bottom fish fishers that they were not sure if there would be an effect or not, and if the effect would be beneficial or not, until a platform was deployed and they could see any changes happening to their fishery. The fishers also noted that the bottom fish fishery has been in serious decline for years with longer periods of closure every year (Fukuyama 2008, Cambra 2008). Maintaining ongoing dialog with the fishers would be a useful way to address this potential issue.

5. What happens to the waste besides theoretical assumptions?

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that, “Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes’ metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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.”

The design of this project is to solve any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, “At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent.” (Please see UH Environmental Center letter in the appendix to the FEIS).

As described on p. 2-42 of the DEIS, Section 2.4 on Water Quality, given the distance from land and depth of water, the strict standards for water quality for oceanic waters, the high volume of water moving through the site quickly diluting excess nutrients, and the high variability of natural concentrations of nutrients due to cyclonic eddies as described in the Current Study in the DEIS, the proposed project is expected to have a less than significant impact on water quality in the surrounding ocean.

The ocean current study in the EIS Appendix B concludes on page 11 stating, “The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998).” (Lukas 2008, p. 11).

“Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the

mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

“Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton).”(Lukas 2008, p. 11).

6. How fast can the globes recover from drifting outside their areas?

As noted in Section 2.10 on Emergency Services and Human Health and Safety, (p. 2-98 DEIS), it states that “In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology will contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be immediately notified. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere however; a salvage company will be called in the event the work crew can't handle the problem.

As noted in the EIS Section 1.4 Description of the Proposed Action (p. 1-12 DEIS), “Free drifting 'subsurface' floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT professor, as per 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. A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area (see Appendix C) 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 hours of failure by the 24/7 dispatch marine salvage company, such as the work boat the “Raven” operating out of Honokohau Harbor.”

7. And what is the impact for the shoreline fishery

Please see the response to #4 above.

8. If your project is approved as it appears, community meetings in N. and S. Kohala regarding your project is essential

Hawaii Oceanic Technology is committed continue its community outreach by regular attendance and updates at the Kawaihae Local Resource Council meetings in Kawaihae. In addition, the company will begin to schedule meetings with other community and service related organizations outside Kawaihae area in the communities of Waimea and Hawi/Kapaau area. Community outreach will also include a website and posting of results of our monitoring programs. The company is also interested in speaking through the ReefTalk public presentation series sponsored by the UH Sea Grant program.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,

A handwritten signature in black ink, appearing to read 'William A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813



**SIERRA
CLUB**
FOUNDED 1892

Hawaii Chapter, Maui Group
P.O. Box 791180, Paia, HI 96779



April 6, 2009

Laura, H. Thielen, Chair
Department of Land and Natural Resources
1151 Punchbowl Street
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DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

RE: Ahi Aquaculture Project DEIS, Kohala Coast, Hawaii

Aloha;

The Sierra Club-Maui Group has reviewed the Draft Environmental Impact Statement of the Hawaiian Ocean Technology proposal for the Ahi Aquaculture Project off the Kohala Coast of the island of Hawaii. We wish to share the following comments:

Overview:

The Sierra Club-Maui Group believes that the scope of this project is far too large, given that it involves species not previously farmed in mariculture operations in Hawaiian waters, and involves untested technology with, "dynamic positioning system and propulsion systems," of the submerged Oceansphere fishpen enclosures.

The posting in the OEQC's Environmental Notice states that, "No adverse impacts are anticipated to Geology, Sediments, Soils and Topography, Land Use and Aesthetics, Water Quality, Biological Resources, Traffic and Transportation, Air Quality, Socioeconomic Conditions, Human Health and Safety, Archeological and Cultural Resources." However, it is well-documented that large mariculture operations are responsible for a broad array of problems, including, but not limited to: Pollution of surrounding waters and benthic habitat; diseases; parasites; penned fish escapes, contaminating wild populations; attracting predators, including sharks; disruption of wild fish and ocean mammal migration patterns; numerous concerns with composition of fish food; and more.

Lastly, with target markets of Japan and the Mainland, it is not clear that this project proposal contributes to solving Hawaii's dilemma of being extremely

dependent upon food imports. Rather than achieving claims of local economy and job creation, this proposal does not demonstrate significant benefits to the local economy or food sustainability issues, relative to the vast size of the operation and likelihood of significant impacts.

Significant Impacts on Marine Species

The proposed lease of a square kilometer (247 acres) of the ocean with twelve submerged cages and a large concentration of penned fish would serve as a Fish Aggravating Device, potentially disrupting wild fish species from their regular migration patterns (this area is described as trolling lanes for ono and mahimahi — page 2-46). Moreover, it is understood that sharks are attracted to fish pens, as Kona Blue Water Farms found it necessary to kill a large tiger shark that was frequenting their operation. Additionally, it can be expected that the endangered Hawaiian monk seal would be attracted to the concentration of sea life in the lease area, thus putting it at risk with the proximity of sharks.

The estimated population of protected humpback whales in Hawaii is grossly underestimated (page 2-52). The DEIS cites a study published in 2003. It is now understood that as many as 10,000 humpbacks may spend the winter months in Hawaiian waters. While the proposed lease site is one mile outside of the designated federal sanctuary waters, it remains to be seen what the impacts to them may be from this proposed ocean installation.

The DEIS states that mitigation measures will be described in a Shark Management Plan, Marine Mammal Management Plan, Endangered Species Management Plan (page 2-16), and a Marine Management Monitoring Plan (page 2-60), to be developed in consultation with NMFS and DLNR. However, by not making such plans available for public review at this time, it is not possible to adequately assess their potential effectiveness. These questions need to be adequately addressed before this project moves forward:

- 1) When will Shark, Marine Mammal, and Endangered Species Management plans be developed and be available for review?
- 2) To what degree will the general public have an opportunity to help develop these plans?
- 3) What length of time is adequate to monitor marine mammals and other ocean species in the proposed lease area before deploying such a large operation? One year? Two years? More?
- 4) What agencies were consulted to determine the frequency of

Hawaiian monk seals in this region?

- 5) Why was a six year old study used to estimate humpback whale population? Will an updated study be cited to correct this?

Untested Technology

The twelve proposed Oceansphere fish enclosures have not previously been utilized in Hawaiian waters, as they represent a new technology seeking, in part, to avoid potential impacts of entanglement issues with mooring lines. There are a host of unanswered questions regarding the technology proposed for this aquaculture operation:

- 1) What is the expected life span of the Oceansphere cages?
- 2) What testing has been done to assure the dynamic positioning system, propulsion system, and automated feeding systems will work?
- 3) Should the propulsion system malfunction, what is the response time and response plan to be employed by the salvage crew?
- 4) What is the potential for damage or loss to the GPS Receiver/ Telemetry Buoy from collision with ocean vessels or creatures?
- 5) What effect will the salt water environment have upon the vital electronic components of the Oceansphere?
- 6) What monitoring systems would be in place to assure that the automated feeding dispenser is functioning properly?
- 7) Describe the "Unmanned underwater robots" (page 1-16) that would be used to remove dead fish. What is the back up plan? What overall system would be deployed to clean bottom of the cage fouling? Where would these wastes be disposed, once they are removed?

Fish Food

Many questions persist about procurement of the huge amounts of fish feed described as necessary for this venture. The DEIS states that the operation would require 1,000 tons (2,000,000 pounds) of feed stock per month, arriving in 40 containers. It also states that, "The source of the feed is determined by the supplier" (page 1-15).

As a secondary impact to the proposed project, the immensity of the fish feed requirements must not be minimized. A full disclosure should be made of the composition of the feed, especially in light of the claim that, "HOT is committed to producing organic grade tuna" (page 1-17).

- 1) How does HOT define "organic grade tuna?" Can the end product be deemed organic if fed with non-organic feed?
- 2) What is the source of soy protein utilized in the feed, and what cultivation practices were employed? Pesticides? Herbicides? Were the soybeans genetically modified? Certified organic?
- 3) To what extent is it possible that the operation could use locally produced fish feed? If not possible, why not? What are the best possibilities, as well as the limitations, of keeping the feed input cycle sustainable by employing local, not imported food?
- 4) To what extent does this project meet the sustainability guidelines and goals of the Island of Hawaii Whole System Project Phase I Report, prepared by Rocky Mountain Institute under contract with The Kohala Center?
- 5) What are the expected impacts of introducing thousands of tons of land-based feed into the ocean environment? What are the impacts to the fish that are fed a diet other than that naturally occurring in the ocean?
- 6) What is the specific source of the fish meal and fish oil additives in the feed, and the impacts of harvesting bait fish in the region of influence from which they were taken? What species of fish? From what area of the ocean? What are the prices?

Overall Sustainability

At a recent meeting of the Kawaihae Local Resource Council, a community member stood up and asked, "Why are we being asked to feed the rest of the world when we can't even feed the people in Hawaii?" Indeed, the business model for this venture targets markets in Japan and the Mainland. The DEIS states the overall demand for ahi in Hawaii is 3,307 tons yearly (page 1-3), so the proposed project at 6,000 tons yearly (page 1-17) is nearly double the local demand. The Japan market for sashimi-grade ahi, by comparison, is estimated at nearly 700,000 tons yearly (page 1-3).

The Sierra Club-Maui Group is supportive of establishing new jobs for Hawaii that fit within the framework of true local sustainability, as well as those that support local food and energy production. It is short-sighted to establish such a huge business venture predicated on cost of air freight continuing to be affordable. World economic events are likely to unfold in years to come whereupon shipping costs preclude the viability of large exports from Hawaii to faraway destination.

- 1) What percentage of fish farm ahi is to be retained for local markets on the Big Island, and elsewhere in Hawaii?
- 2) What economic studies were consulted to verify the long-range viability of air freight shipments of ahi to Japan and the Mainland?
- 3) What algae-to-biodiesel operation have you forged a partnership with to use algal protein to supplement fish feed? (page 1-16) What quantities of such a product do you believe might be available, and when, considering that algae-to-biodiesel is considered to be years away of being produced on a commercial scale?
- 4) How does the proposed project meet the goals of the Hawaii 2050 Sustainability Master Plan?
- 5) What government assistance or subsidies may be required, or is it anticipated that this venture could sustain itself without such support?
- 6) How do you define sustainability? Can sustainability be imported? Can it be exported? Is it important to this project, or to Hawaii?

Public Outreach

The Sierra Club-Maui Group believes that community-based planning leads to better outcomes, with fewer conflicts. It appears, however, that HOT has conducted only a bare minimum of public meetings to discuss their massive project proposal. Of those listed in the Public Outreach meetings (page 4-4), only one meeting in August, 2008, can be deemed as a true public meeting to an unbiased group.

- 1) When was the official scoping meeting held for this DEIS? Where?
- 2) Is there a compelling reason why the specific plans for this project have not been discussed with the community? What future outreach does HOT have for discussing this project, before issuing a final environmental document?

- 3) What Hawaiian cultural groups have been consulted? Does HOT deem it sufficient to meet with individual Hawaiians, but not organizations?
- 4) To what extent is HOT working with the DLNR to assure there will be sufficient public notice before a hearing is held on a CDUA application to discuss the ocean lease of this conservation area?

Conclusion

The DEIS as written is insufficient in describing potential adverse impacts of this project in terms of secondary impacts, real threats to ocean mammals, fish, and endangered species, economic impacts, cultural impacts, technological capabilities and limitations, and related issues of sustainability and public outreach. Common sense dictates that such a project proposal should prove its viability first on a small scale, before seeking approval for a project of such imposing size and scale. The Sierra Club-Maui Group hopes that the crucial omissions in this DEIS may be adequately addressed for the next round of public discussion.

Sincerely,

Robert Parsons
Conservation Chair
(808) 280-1369



cc: Lance Holter, Sierra Club-Maui Group, Chair
Bill Spencer, Hawaiian Ocean Technology
George Redpath, Tetrattech
Katherine Puana Kealoha, OEQC

Hawaii Oceanic Technology since its inception has reached out to the public and is committed to continued community outreach. Please see the reference contained in the response to #1 above.

3. What Hawaiian cultural groups have been consulted? Does HOT deem it sufficient to meet with individual Hawaiians, but not organizations?

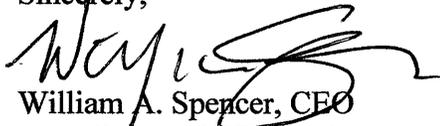
As noted in the Hawaii Oceanic Technology Chapter on Cultural Resources and in the Cultural Impact Assessment, Hawaii Oceanic Technology consulted with the native Hawaiian groups and individuals who are directly related to the specific region of the project. The Ho`opai ohana is a large family of native Hawaiians who have a multi-generational history with these coastal lands. The Hawaiian group, Ka'ike o Ka'aina, is led by Michael Hanohano, who was also consulted during this study.

4. To what extent is HOT working with the DLNR to assure there will be sufficient public notice before a hearing is held on a CDUA application to discuss the ocean lease?

Hawaii Oceanic Technology is working closely with the DLNR to follow its lead in providing public notice of all public hearings on this project. DLNR is responsible for placing public notices in the media and all such notices were provided in accordance with the law in a timely manner.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

**Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813**

Mr. Robert Parsons
Conservation Chair
Sierra Club Hawaii Chapter Maui Group
P.O. Box 791180
Paia, HI 96779

Aloha Mr. Parsons ~

Thank you for your letter dated April 6, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. This letter is to provide responses to address your questions, which are summarized in text that is highlighted in boldface type. Where useful, a reference and quote from the EIS will be provided to address the question.

In your letter, you provide a series of comments and some specific questions. This letter will provide a response to each question following the categories in your letter. Your question is presented first in bold face font. Then, in regular font following each question, a response is provided.

Significant Impacts on Marine Species:

1. When will Shark, Marine Mammal, and Endangered Species Management plans be developed and be available for review?

Hawaii Oceanic Technology is not preparing any management plans for sharks, marine mammals, or endangered species. All management authority over these resources is with the relevant state agency (e.g., DLNR Division of Aquatic Resources) and federal agency (e.g., National Marine Fisheries Service). It is these agencies and the laws they implement that will determine what Hawaii Oceanic Technology does in terms of monitoring this wildlife and managing our interactions with them.

As stated in the Hawaii Oceanic Technology EIS, Section 2.5 Biological Resources, (p. 2-65 DEIS), "A monitoring program will be established as part of this project to watch for any adverse affects that may occur. If any adverse affects are identified project operations will be modified to minimize those effects. Consultation with appropriate federal agency officials will guide the protocol for managing and monitoring any interactions between employees and marine mammals. Impacts are expected to be less than significant with this monitoring in place.

Here is the section from the DEIS that discusses your question:

Monitoring Program

- Monitoring by qualified observers, preferably by third-party qualified biological Resource personnel, of spinner dolphin and other marine mammal species (and sea

turtles) in the area of the platforms would be required to ensure no deleterious effects of any kind result from interactions (particularly unforeseen) with the platforms.

- Reports of all monitoring will be distributed to agency personnel and research groups.
- Surveying should be done daily by cleaning and maintenance personnel of Hawaii Oceanic Technology, however, surveying also should be done at least once a week initially, with surveys decreasing in frequency once quantified data show less than significant effects are occurring.
- All on-site project personnel will be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal and state laws.
- Local marine wildlife experts and agency personnel will be contacted and informed of the impending work that exceeds daily and routine maintenance; in addition, wildlife experts and agency personnel must be immediately contacted in the event of any marine wildlife concerns, including collisions, strikes, or entanglements that may occur during the project.
- Preparation and presentation of a Marine Mammal Monitoring Plan will be incorporated into the project design.

Sharks. In meetings with the public, special interest groups, and various other forums, there has often been concern expressed about the potential for the platforms of the proposed operation to act as FADs and thus, via increasing fish species in a localized area, increasing the likelihood of sharks in the area. Although increasing fish species offers great potential

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2.5 Biological Resources

benefits to fishermen, as discussed above, it is also recognized that the FAD action of an OOA operation may attract sharks to the area. In addition, sharks may be drawn to the platforms because of a greater availability of food (either from the excess fish food, from the visibility of the fish inside the platforms, from the scent of dead fish in the platforms, or because of the greater biomass of other fish outside the platform). The impact on biological resources or on humans from increased shark presence in the location of the proposed project would have to be studied and potentially mitigated.

While it is possible that if sharks are drawn to the platforms, it could lead to increased predation on dolphins or other marine mammals in the area, there are no recorded instances. The likelihood of different species being located in the same area at the same time would increase as a result of the presence of the platforms and all observations will be recorded per the monitoring program.

An increase in resident sandbar sharks (*Carcharhinus plumbeus*) did occur in the second stage of the Ewa Beach platform trials, though not in the initial series of experimental platforms. Randy Cates (owner and operator of the moi farm offshore of Ewa Beach) suggested that based on his observations; there will be no aggregating effects of the platform on sharks (pers. comm.). There is no quantifiable evidence showing an effect or no effect. Therefore, it is not known if sharks may be aggregated to the platforms, and if so, if this would mean an actual increase in the number of sharks in the overall area, or just a shift in distribution of the same numbers that already occur. If sharks are drawn to the platform, they will presumably be drawn away from other adjacent areas, thereby reducing the apparent density of sharks (which might result in a decreased risk to the public from sharks). However, no conclusions can be drawn at this time as there are only anecdotal data.

As this project proposes a substantial increase in total production and number of platforms, more divers will be required to complete regular maintenance. Both the proposed and

alternative sites are 3 miles (2.6 nautical miles) from land and potentially less protected from storms and dangerous sea conditions. These factors could increase the number of mortalities within the platforms as well as increase the length of time mortalities remain in the platforms, causing an increase in attraction by sharks and other predators to the platforms. While this argument remains speculative and will require further study to determine the actual impact, the proposed project would create the opportunity for continual interactions between humans (divers) and sharks. The need to remove sharks is not incidental and in fact may be a necessary part of the success of the operation. To minimize potential impacts the following shark safety plan will be put in place as part of this project.

Shark Safety Plan (Modeled after DAR).

Divers should always be aware that sharks could appear. If a shark is sighted, the list below are procedures to be followed:

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2.5 Biological Resources

- Divers are to notify each other by hand sign (hand held fin-like on top of head) and divers are to aggregate together and face the shark.
- Divers should try to keep their backs to the platform, buoy, boat or other obstacle.
- Divers are not to make any sudden movements, swim away hurriedly, splash, take photographs or flash lights at the shark.
- Divers should surface to discuss if the dive should continue as soon as it is safe to do so.
- No dive is to continue if any diver feels uncomfortable or would prefer to abort.
- No employee is ever expected to enter the water when sharks are around the platforms; any dive undertaken when sharks have been sighted must be at the diver's sole and absolute discretion.
- All sharks sighted are to be noted in the dive log. Record number of sharks, identifying features (species, length, distinguishing marks), behavior towards divers, and period of residence around the platforms.
- Management must be notified of these encounters.

There may be occasions when the offshore crew may have to use extra precautions with sharks. These occasions include, but are not limited to; 1) Shark at site is aggressive towards divers and other objects, 2) Shark has taken up residence or has become territorial at the site. At this point, this is defined by viewing the same shark at the site for 2 or more days in succession. All procedures mentioned above still apply. In addition, extra precautions are listed below:

- Divers/Snorkelers must add an additional diver to the team size (i.e. 3 divers instead of the normal 2).
- Divers/Snorkelers must remain within view on surface or underwater.
- One of the dive team must carry a shark "poker" (large stick) if the divers remain in close proximity (<20 ft).
- If divers are not in close proximity, every diver should have a "poker."

The diver supervisor on site is responsible for all dive operations so he/she can suspend any dive operations if they believe it is necessary. If anyone shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP, Operations and/or the President. Prior to any further action, management will consult with the local office of Division of Aquatic Resources to determine the next course of action (i.e. baiting, hooking and/or tagging) to discourage the shark from visiting the site.

Additional Conservation Measures

Monitoring and Reporting. Hawaii Oceanic Technology will undertake, at its own cost, to develop a Monitoring Plan (MP) for documenting all interactions between the project and marine mammals, sea turtles, and sharks. This will be prepared in consultation with NOAA

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2.5 Biological Resources

Fisheries. The assistance of marine mammal scientists, HIIHWNMS staff, and/or NOAA Fisheries experts will be obtained to design a program that ensures the maximum practical amount of usable information is collected and incorporated into an MP. This would be similar, though less broad in scope, to the current MP undertaken and currently in process by the US Navy, NAVFAC Pacific, for Hawaiian waters, based on recommendations by local marine mammal mitigation experts (Smultea et al. 2007). Mattila and Walters (pers. comm.) also indicated that “detailed measures of abundance or spatial distribution were not needed, but that basic records of interactions would suffice.” That is, the MP will include a record of any interactions between marine wildlife and the project structures (platforms), such as any close approach of a whale, such as within 30 meters (100 feet) (as regulated by the MMPA). All Hawaii Oceanic Technology staff shall also adhere to federal recommendations or instructions in the unlikely event of any collisions, or ship strikes. The initial response will be to immediately call the NOAA Fisheries Marine Mammal Stranding Hotline (1-888-256-9840). Hawaii Oceanic Technology could work with HIIHWNMS officials to train staff in appropriate first-response measures, although liability concerns need to be addressed prior to undertaking this mitigation measure. Hawaii Oceanic Technology recognizes the complexity of these issues, with sanctuary protocols and ESA considerations, but still affirms their willingness to assist sanctuary or NOAA Fisheries in any such manner that is deemed appropriate.

2. To what degree will the general public have an opportunity to help develop these plans?

Hawaii Oceanic Technology is committed to working with the federal and state government management agencies to develop these monitoring plans. The public involvement in developing these monitoring plans is a decision to be made by the management agencies. Hawaii Oceanic Technology is committed to raising community awareness of our oceans. With guidance from these government agencies, Hawaii Oceanic Technology will provide the observational data resulting from these wildlife monitoring programs and the water quality monitoring programs to the community. Where possible and so long as the data does not conflict with proprietary procedures, such data may be published on our web site.

3. What length of time is adequate to monitor marine mammals and other ocean species in the proposed lease area before deploying such a large operation (1 yr? 2yrs?, more?)

The Hawaii Oceanic Technology EIS uses the best available data on incidence of marine mammals in this area. The CDUA and EIS propose to initiate wildlife monitoring efforts once ocean deployment commences. The timing of the monitoring will be determined by the appropriate government resource management agencies.

4. What agencies were consulted to determine the frequency of Hawaiian monk seals in this region?

The Final EIS utilizes data on monk seals in Hawaii from the 2008 Stock Assessment done by the National Marine Fisheries Service. The chapter on “Hawaiian Monk Seal” in “U.S. Pacific Marine Mammal Stock Assessments: 2008” was prepared by Carretta, et al. (NOAA-TM-NMFS-SWFSC-434, US Department of Commerce, NOAA, NMFS, SWFC). This study concludes that:

“The NMFS collects information on seal sightings reported by a variety of sources. Recently, the number of such reports has increased and related database improvement efforts have been underway. The total number of individually identifiable seals documented in this way in 2006 was 83, the current best minimum abundance estimate” (Carretta, et al 2008: p. 42)

5. Why was a six year old study used to estimate humpback whale population? Will an updated study be cited to correct this?

In the Final EIS, data for humpback whale populations is taken from the 2008 SPLASH Report done in conjunction with the Hawaiian Islands Humpback Whale National Marine Sanctuary (Calambokidis, et al., 2008, *SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific*, p. 2) This report concluded that, *“After reconciling all within and cross-regional matches (from both the primary match and rechecks), a total of 7,971 unique individuals were cataloged in SPLASH.”* (Calambokidis, et al., 2008, p. 2)

Untested technology:

1. What is the expected life span of the Oceansphere cages?

The expected life time is 10 years, but with proper maintenance and periodic replacement of subsystems, the lifetime could be 20 years.

2. What testing has been done to assure the dynamic positioning system, propulsion system, and automated feeding system will work?

Technologies to be employed for dynamic positioning and propulsions have been in place for several years in oil drilling and US Navy operations. Our design engineering contractor has built and deployed such systems for many years. The automated feeding system has been demonstrated by the University of New Hampshire for several years and will be adapted to our needs.

3. Should the propulsion system malfunction, what is the response time and response plan to be employed by the salvage crew?

As noted in Section 2.10 on Emergency Services and Human Health and Safety, (p. 2-98 DEIS), it states that *“In case an aquaculture platform becomes inoperative while it is deployed, Hawaii Oceanic Technology is required to contract with a salvage company that can provide 24/7 emergency response. An ocean sail, also known as 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. The Coast Guard will be immediately notified. The Oceansphere monitors will dispatch a work boat to the area and the salvage ship will be on call. In most events the work boat will be able to restore the Oceansphere however; a salvage company will be called in the event the work crew can't handle the problem.*

As noted in the EIS Section 1.4 Description of the Proposed Action (p. 1-12 DEIS), *“Free drifting 'subsurface' floating cages will not likely come ashore as ocean currents diverge at ocean-land margins (Cliff Goudy, MIT professor, as per 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. A salvage company will be retained to retrieve the Oceansphere upon failure. By inspecting the average currents in the North Kohala area (see Appendix C) 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 hours of failure by the 24/7 dispatch marine salvage company, such as the work boat the "Raven" operating out of Honokohau Harbor."

4. What is the potential for damage or loss to the GPS Receiver/Telemetry Buoy from collision with ocean vessels or creatures?

The potential is very low. The buoy will have hazard light that can be seen by ocean going vessels for up to two miles. There will be a US Coast Guard transponder with a unique identifier on the buoy. It is expected that some "creatures" may become curious, but will be able to avoid collision. There will be no potential for entanglement.

5. What effect will the salt water environment have upon the vital electronic components of the Oceansphere?

All components will be able to withstand marine environment. Electronic components will be appropriately shielded. Anti biofouling treatments will also be employed.

6. What monitoring systems would be in place to assure that the automated feeding dispenser is functioning properly?

There will be a variety of monitoring systems including cameras, the ability to measure fish growth and sensors within the feeding systems themselves. Daily maintenance will also assure that food is being properly dispensed.

7. Describe the "unmanned underwater robots" that would be used to remove dead fish. What is the backup plan? What overall system would be deployed to clean the bottom of the cage fouling? Where would these wastes be disposed, once they are removed?

Unmanned underwater robots, such as Seabotix, San Diego, will be used to remove mortalities. Estimated cumulative mortality is expected to be 1%.

Fish Food

1. How does HOT define "organic-grade tuna?" Can the end product be deemed organic if fed with non-organic feed?

Hawaii Oceanic Technology will follow the requirements of The National Organics Standards Board (NOSB) in its definition of organic aquaculture. The NOSB is currently working on "Proposed Organic Aquaculture Standards" (most current draft dated September 28, 2008) in which answers to your question are being proposed for consideration by the public and the regulatory agencies. As there are no specific guidelines in place, we will specify to our food suppliers that they use organic sources in their formulation.

2. What is the source of soy protein utilized in the feed, and what cultivation practices were employed? Pesticides? Herbicides? Were the soybeans GM? Certified organic?

The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The company has no plans to use GMO soy. The company plans to produce the highest quality ahi, suitable for sashimi. When the NOSB finalizes its organic standards, Hawaii Oceanic Technology plans to follow its requirements for organic aquaculture.

3. To what extent is it possible that the operation could use locally produced fish feed? If not possible, why not? What are the best possibilities, as well as the limitations, of keeping the feed input cycle sustainable by employing local, not imported food?

As stated in the EIS, Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources. The company has begun discussions with possible suppliers who might eventually have the capability to meet our supply requirements, but has not finalized any contract to source the feed components locally, yet.

4. To what extent does this project meet the sustainability guidelines and goals of the RMI/Kohala Center "Whole System Project Phase I Report?"

This project is consistent with the **Whole System Project Phase I Report** because this project is a sustainable use of ocean resources for environmentally-friendly food production for local consumption and export that provides stable employment for local residents and is consistent with state plans and policies.

5. What are the expected impacts of introducing thousands of tons of land-based feed into the ocean environment? What are the impacts to the fish that are fed a diet other than that naturally occurring in the ocean?

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that, "Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes' metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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."

The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, "At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent." (Please see UH Environmental Center letter in the appendix).

The ocean current study in the EIS Appendix B concludes on page 11 stating, "The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated

with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998).” (Lukas 2008, p. 11).

“Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

“Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton).”(Lukas 2008, p. 11).

6. What is the specific source of the fish meal and fish oil additives in the feed and the impacts of harvesting bait fish in the region of influence from which they were taken? What species of fish? From what area of the ocean? What are the prices?

The fish feed proposed to be used in the operation is pelleted fish feed. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is very transparent about their feed ingredients and processing and will produce our feed to exacting specifications. At this time, the vendor to supply the fish feed has not been selected. So, the details you request regarding the source of the fish meal and fish oil are currently not available.

Overall Sustainability:

1. What percentage of fish farm ahi is to be retained for local markets on the Big Island and elsewhere in Hawaii?

Hawaii Oceanic Technology Draft EIS (p. 2-93) states: “Hawaii Oceanic Technology is planning to supply only 10 percent of the local market with the open-ocean raised Yellowfin and Big Eye tuna to educate customers of hotels and restaurants about the qualitative characteristics of the clean ranching conditions of its farm raised tuna.” The company is concerned about negative impacts on the local tuna fishing industry and is therefore limiting its sale of farm raised ahi to a negligible percentage of the local catch.

2. What economic studies were consulted to verify the long-range viability of air freight shipments of ahi to Japan and the Mainland?

The long-range viability of air freight shipments of ahi to Japan and the Mainland were based on the company's financial projections including estimated future shipping costs, as well as estimated future tuna prices. There is no evidence that airlines will stop providing freight services to Japan and the Mainland at any time in the future.

3. What algae-to-diesel operation have you forged a partnership with to use algal protein to supplement fish feed? (p. 1-16) What quantities of such a product do you believe might be

available, and when, considering that algae-to-diesel is considered to be years away of being produced on a commercial scale?

As stated in the DEIS (p. 1-16), “the company is forging partnerships...” No finalized contract has been negotiated with any specific partner, such as local farmers or algae-to-diesel production operations. Consequently, the data about quantities and availability is not finalized.

4. How does the proposed project meet the goals of the Hawaii 2050 Sustainability Master Plan?

This project is consistent with the **Hawaii 2050 Sustainability Master Plan** because this project is a sustainable use of ocean resources for environmentally-friendly food production for local consumption and export that provides stable employment for local residents and is consistent with state plans and policies.

5. What government assistance or subsidies may be required, or is it anticipated that this venture could sustain itself without such support?

Hawaii Oceanic Technology does not currently have any government grants, and is entirely funded by private equity financing. Nonetheless, if there are any government grants offered by various government agencies, the company may choose to pursue such sources of funding.

6. How do you define sustainability? Can sustainability be imported? Can it be exported? Is it important to this project, or to Hawaii?

Hawaii Oceanic Technology is committed to sustainable economic development. A straightforward definition provided by the American Heritage Dictionary (Houghton Mifflin Co. 2009), for the word, “sustainability” is the noun form of the word “sustainable,” which means, “capable of being continued with minimal long-term effect on the environment.” The project proposes to grow ahi in a sustainable manner, while protecting the environment, assuring economic capacity to operate and provide meaningful work for local area residents. While some ahi produced in the aquaculture operation will be sold in the local market, the target market for the ahi is in Japan and the U.S. west coast because of the higher demand and price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the Hawaii economy in the form of taxable export revenues, the company’s employees and investors many of which are based in Hawaii.

Public Outreach:

1. When was the official scoping meeting held for this DEIS? Where?

The scoping process for the DEIS included numerous meetings with relevant government officials and members of the public. On September 5, 2006, the company had meetings with relevant government agency officials. In February 2007, the company had additional meetings with DLNR, DOH and DOA. On July 16, 2008, the company had a follow-up meeting with government agency officials. Community meetings that served to help develop the scope of the EIS were held on April 23, 2007 at the meeting of the West Hawaii Fishery Council, and on August 3, 2008 at a meeting of the Kawaihae Local Resource Council. Other meetings with public agencies, other community organizations, and community members are summarized in Figure 4-1 on p. 4-4 of the DEIS.

2. Is there a compelling reason why the specific plans for this project have not been discussed with the community? What future outreach does HOT have for discussing this project, before issuing a final environmental document?

Hawaii Oceanic Technology since its inception has reached out to the public and is committed to continued community outreach. Please see the reference contained in the response to #1 above.

3. What Hawaiian cultural groups have been consulted? Does HOT deem it sufficient to meet with individual Hawaiians, but not organizations?

As noted in the Hawaii Oceanic Technology Chapter on Cultural Resources and in the Cultural Impact Assessment, Hawaii Oceanic Technology consulted with the native Hawaiian groups and individuals who are directly related to the specific region of the project. The Ho`opai ohana is a large family of native Hawaiians who have a multi-generational history with these coastal lands. The Hawaiian group, Ka'ike o Ka'aina, is led by Michael Hanohano, who was also consulted during this study.

4. To what extent is HOT working with the DLNR to assure there will be sufficient public notice before a hearing is held on a CDUA application to discuss the ocean lease?

Hawaii Oceanic Technology is working closely with the DLNR to follow its lead in providing public notice of all public hearings on this project. DLNR is responsible for placing public notices in the media and all such notices were provided in accordance with the law in a timely manner. Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813



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2009 APR 17 A 8: 27

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

April 9, 2009

Laura H. Thielen
Department of Land and Natural Resources
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

CC: Bill Spencer, Hawaii Oceanic Technology; George Redpath, Tetratich; Katherine Puana Kealoha, OEQC

RE: Ahi Aquaculture Project DEIS

Dear Ms. Thielen,

On behalf of Food & Water Watch (FWW), a national non-profit consumer advocacy group that works to promote clean, safe seafood for consumers and the use of common resources for the public benefit, we write to request that you not move forward with the Ahi Aquaculture Project. The Draft Environmental Impact Statement (DEIS) is full of contradictions and is inadequate in the details it provides about the project, such that the public is unable to effectively understand potential impacts.

As expressed in our recent letters concerning Kona Blue Water Aquafarm's Supplemental Environmental Assessment and request for a CDDA permit, FWW and other groups with which we work in Hawaii and throughout the mainland U.S. have a range of concerns relating to the environmental sustainability of open ocean aquaculture in general. Hawaii Oceanic Technology, Inc.'s (HOTI) Ahi project is particularly concerning because of its unprecedented size – 12 times the maximum capacity Kona Blue has ever reached - its use of new ocean thermal energy exchange technology, and its disregard for cultural resources and traditions.

Overarching Concerns With Open Ocean Aquaculture

If not carefully developed and regulated, open ocean aquaculture could damage marine ecosystems, threaten the livelihoods of fishermen and those employed in the tourist industry, and interfere with important cultural traditions and resources. For these reasons, open ocean aquaculture is highly controversial, and a variety of publications by researchers, NGOs, and government offices have noted problems associated with the development of this industry:

- “Little is known about the assimilative capacity of marine ecosystems for the wastes produced by aquaculture operations.” – Report of the Marine Aquaculture Task force, 2007
- “[T]here are strong reasons to do more to address the environmental effects of U.S. aquaculture.” – Pew Oceans Commission Report, 2003



- “New and developmental technology, the risk and uncertainty associated with exposed open ocean locations, lack of operational experience, and high capital start-up costs make estimating profitability... difficult for new open ocean ventures.” – Congressional Research Service report on open ocean aquaculture, 2006
- “Sea lice epidemics, together with recently documented population-level declines of wild salmon in areas of sea-cage farming are a reminder that sea-cage aquaculture is fundamentally different from terrestrial animal culture... a sea cage... becomes an unintended pathogen factory.” – Study by L. Neil Frazer, University of Hawaii at Manoa
- A Government Accountability Office report's findings illustrate that significant barriers still exist in the development of an environmentally safe offshore aquaculture industry - Rep. Nick Rahall's, Chairman of the House Natural Resources Committee, description of May 2008 GAO report

Due to these concerns, FWW strongly recommends that the precautionary principle be applied to open ocean aquaculture. In other words, open ocean aquaculture projects, such as HOTI's Ahi farm, should not proceed until extensive science has confirmed that it will not harm ecosystems or communities. HOTI's DEIS fails to show this for reasons described below.

New Technology

As stated in the DEIS and application, HOTI proposes to farm Ahi in “Oceanspheres” – offshore, un-tethered, 54m diameter, submerged cages. Existing marine aquaculture projects in Hawaii have been tethered to the ocean bottom, but these cages will use a dynamic positioning system to stay in place. A propulsion system – powered by an ocean thermal energy conversion engine, which draws up cold water from deep below - will be used to maintain the position of the spheres. Although the DEIS describes the technical aspects of how the propulsion and power systems will work (p. 1-13 - 1-14) it fails to describe what impacts this energy conversion will have on the surrounding environment, and fish and other marine life beneath the cages. The following questions should be answered prior to the project moving forward:

1. How will fish and other marine animals/organisms be affected by the drawing up of deeper water?
2. Will the cold water inlet pull in aquatic animals/organisms?
3. How strong is the suction for the water being pumped up?
4. How much water will be pumped up over a specific time frame?
5. Will local current patterns (which supposedly are currently uniquely suited for effluent dispersal) be affected?

Size

A farm of this size is unprecedented in Hawaiian waters. HOTI plans to scale up until annual production capacity is 6,000 tons of Ahi a year – or so it appears. Twice in the document it is written that 12,000 tons of Ahi will be produced each year when the

project is completely developed (p.2-29 and 2-134). These discrepancies must be clarified. If 6,000 is the actual expected tonnage, which can be assumed, this will still be 12 times the amount of fish produced last year by Kona Blue Water Farms, which HOTI compares itself to throughout the document. A farm of Kona's size has not even existed long enough to demonstrate that long term and cumulative effects of fish farm effluent are not damaging to the marine environment, so one the size of HOTI must certainly be approached with great caution. There is much to be understood about these effects. For instance, a new Stanford computer simulation has shown that effluent from pens will travel farther, and in higher concentrations than had previously been assumed ("When Fish Farms are Built Along the Coast, Where Does the Waste Go?" *ScienceDaily*, Feb. 25, 2009). This should be taken into careful consideration in Hawaii, where the ocean is especially valued for its beauty, traditional importance to the local way of life and the importance of tourism and recreation to the economy.

Feed

According to the DEIS, Ahi requires two pounds of dry feed for every one of wet weight that they grow. Once the company is scaled-up to its anticipated size, it will need a massive 1,000 tons of feed every month – 12,000 tons annually. Typically, a primary issue with tuna farming is the amount of wild fish needed to farm tuna – a farm in Mexico reported using 12 pounds of wild fish to grow just one pound of farmed tuna (Sylvia, Paula C. "Current Status of Bluefin Tuna Farming in North America." Hubbs-SeaWorld Research Institute, Aqua 2006 Meeting Abstract). HOTI says it can minimize wild fish input by using feed that will be composed of 85 percent soy or other protein, 1 percent vitamins and 15 percent fish meal or oil. Sources of feed ingredients are said to be determined by the commercial supplier that HOTI will purchase from (p. 1-15). The following questions must be answered to determine the impacts of this feed use:

1. What is the true ratio of ingredients? These percentages add up to 101 percent.
2. What percentage of fishmeal versus fish oil? The document groups fish meal and oil together into percentage of total feed composition, but in order to understand how much wild fish will be needed to produce this feed, and thus the effects on wild fish populations, this must be specified. If the feed were 15 percent meal, for example the wild fish to farmed fish ratio would be 1.5:1 – which would be quite low, relatively, for tuna production. However, if that 15 percent were oil, which takes more wild fish to produce per unit, the wild fish to farmed fish ratio would be 6:1.
3. What are the effects of adding a significant amount of soy – a terrestrial plant - to the aquatic environment? Soy is high in estrogen, which studies have shown can have damaging effects on wild fish populations, by impacting their ability to reproduce (Kidd, Karen. "Effects of Synthetic Estrogen on Aquatic Population: A Whole Ecosystem Study," Freshwater Institute, Fisheries and Oceans Canada).
4. What precautions will be taken to ensure that the fishmeal and oil is free of contaminants or disease?
5. Where will ingredients be sourced? What fishery will supply the fishmeal/oil and how will soy or other protein be farmed? Will soy be GMO?



Marine mammals/animals

The DEIS states that “all outcomes on dolphins and other marine mammals are unknown at this point (p.2-65).” This is highly inadequate. It is crucial that any operations allowed within Hawaiian waters protect the 22 species of marine mammals living here, including dolphins, sea turtles, sharks, six endangered whale species and endangered monk seals. The proposed site for this project is just outside the Hawaiian Islands Humpback Whale National Marine Sanctuary – a site specifically designated to protect humpback whales and their habitat, and yet it is unclear how the farm will affect migration patterns as whales traverse the site. Also, the DEIS notes that sharks around the cage may need to be killed and removed in order for the operation to be successful – this would not be unprecedented, as Kona Blue Water Aquafarm, nearby, has had to kill a tiger shark that regularly appeared around the facility. Sharks are revered in Hawaiian cultural lore as an *aumakua*, a family guiding spirit or totem, so this would raise cultural sensitivity issues.

Cumulative Impacts

Little is known about the long-term effects from fish farm effluent on the marine environment, especially the cumulative impacts from locating multiple farms in one area. We are yet to fully understand how far pollution is carried, where it can accumulate, how this will impact the aquatic environment over the years, or how much “diluted” pollution one area can hold. If the Ahi aquaculture project is approved, there will already be two farms (including Kona Blue) in the area, and FWW has been informed that other companies are making plans to apply for farms, pending the decision on the Ahi project. In light of this, Hawaii must decide if the islands really want to open the door to this increasing industry before all impacts are understood and scientifically verified.

Cultural conflicts and disruption to fishermen

FWW understands that the Kanaka Council considers this DEIS to be inadequate to traditional, cultural and religious rights, which should be protected under the Constitution of the State of Hawaii:

Article XII, Section 7. The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights.

In addition to the conflict with sharks, as mentioned above, this farm poses serious threats to traditional fishermen. Not only is there inadequate native Hawaiian input concerning the cultural assessment, but there is insufficient information to prove that traditional fishing rights do not exist in the proposed site. In addition, although the DEIS recognizes

that: "... 'ōpelu ko'a (traditional fishing grounds) are very important natural and cultural resources and could be considered as an ATI (area of traditional importance) (p. 2-120)," it fails to adequately discuss how these might be effected by the project. The document states that some fishermen felt that the Oceanspheres would act as fish aggregating devices, affecting the movement patterns of mahi, ono, opelu and bottom fish (p. 2-9) and claims that any ill effects of this will be mitigated by allowing fishermen to fish for the attracted fish on site. However, the question must be raised: if, indeed, the proposed area is not considered to be a ko'a, but opelu are attracted away from the ko'a to the oceanspheres, would not this disruption be considered damaging to traditional fishing practices?

Economic Impacts

The DEIS claims that beneficial impacts for socioeconomic conditions were identified, but fails to sufficiently prove this. The huge farm only plans to employ twenty-two full-time staff by year five of the operation. Also, the farm will not contribute significantly to local food-security; the primary markets for HOTI's Ahi will be California and Japan. Although proponents of open ocean aquaculture would like to argue that Hawaiian-based operations will help to provide the U.S. with more domestically produced seafood, this is disingenuous, when operations such as HOTI actually plan to export product to countries like Japan for a higher dollar.

Conclusion

The DEIS fails to provide adequate information about the new technology used, the source and components of the massive amount of feed that will be purchased and discharged into the ocean, or the impacts on marine animals. It also fails to prove the environmental or cultural impacts can be mitigated. FWW urges DLNR to adopt the precautionary approach to open ocean aquaculture, to reject this DEIS, and not to move forward with HOTI's proposal at this time.

Sincerely,



Marianne Cufone
Director, Fish Program
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Ms. Marianne Cufone
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Aloha Ms. Cufone ~

Thank you for your email of April 9, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. This letter is to provide responses to address your questions (highlighted in boldface type), while referring to the EIS Section where the issue is addressed.

At the beginning of your letter is a section entitled “Overarching Concerns with Open Ocean Aquaculture” in which you state your concerns, cite some references, and make a recommendation to use the precautionary principle in open ocean aquaculture. You conclude that “In other words, open ocean aquaculture projects, such as HOT’s Ahi farm, should not proceed until extensive science has confirmed that it will not harm ecosystems or communities. HOTI’s DEIS fails to show this for reasons described below.”

Since these conclusions are based on specific concerns in different topic areas, our responses will be provided for each topic area including the following:

1. New Technology
2. Size
3. Feed
4. Marine mammals/animals
5. Cumulative Impacts
6. Cultural Conflicts and disruption to fishermen
7. Economic Impacts
8. Conclusion

1. New Technology

In your letter, you state that open ocean aquaculture projects, such as Hawaii Oceanic Technology’s Ahi Aquaculture operation, “should not proceed until extensive science has confirmed that it will not harm ecosystems or communities.” You state that the Hawaii Oceanic Technology DEIS fails to show this, and fails to describe what impacts this energy conversion will have on the surrounding environment, and fish and other marine life beneath the cages.

The responses to your questions are provided below, organized by topic as presented in your letter.

You ask in your letter, “How will fish and other marine animals/organisms be affected by the drawing up of deeper water?”

The EIS Chapter 2.4 on Water Quality states in Section 2.4.2 on Environmental Impacts that “Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130

meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

In your letter, you ask, “Will the cold water inlet pull in aquatic animals/organisms?”

A deepwater pipe is no longer a part of the design.

In your letter, you ask, “How strong is the suction for the water being pumped up?”

A deep water pipe is no longer part of the design.

In your letter you ask, “How much water will be pumped up over a specific time frame?”

A deep water pipe is no longer part of the design.

In your letter, you ask “will local current patterns (which supposedly are currently uniquely suited for effluent dispersal) be affected?”

Because the physical water quality parameters of the deep water are very little different from the surface water, there would be no expectation that the currents would be affected at all.

2. Size

In your letter you state that “a farm of this size is unprecedented in Hawaiian waters. They say 6,000 tons per year, but twice in the document it is written that 12,000 tons of Ahi will be produced each year when the project is completed developed (p. 2-29 and 2-134).”

. The production at full build out may vary between 6,000 tons per year and 12,000 tons depending upon the final system design. The production capacity is a variable that will be adjusted according to engineering and economic decisions that are not yet finalized. The Final EIS will clarify this and be addressed beginning on pps 2-29 and 2-134 in the final EIS.

In your letter, you state that a farm of Kona (Blue)'s size has not even existed long enough to demonstrate that long term and cumulative effects of fish farm effluent are not damaging to the marine environment.” So, you recommend that “...one the size of Hawaii Oceanic Technology must certainly be approached with great caution.” You refer to a Science Daily 2-25-2009 article on fish farm effluent, stating "this should be taken into careful consideration in Hawaii..."

Please see the current study in EIS Appendix B, which concludes on page 11 of the Current Study saying, “The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998).” (Lukas 2008, p. 11).

“Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

“Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton).”(Lukas 2008, p. 11).

The design of this project is to solve any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore north Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, “At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent.” (Please see UH Environmental Center letter in the appendix).

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that, “Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes’ metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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.”

The Science Daily Article can be referenced at the following web

site. <http://www.sciencedaily.com/releases/2009/01/>

[090115164607.htm](http://www.sciencedaily.com/releases/2009/01/090115164607.htm) Please review this article which reports on a study led by UK

University of Exeter let international team that describes how alkaline in fish feces counters the effect of CO2 in shallower waters. In other words, fish poop may be good for the oceans.

3. Feed

In your letter, you refer to the abstract of an article by Sylvia (2006) on bluefin tuna farming which says you need to feed 12 lbs of wild fish to get 1 lb. farmed tuna. You ask “How can HOTI do 2:1 feed to tuna ratio?”

The main difference between catch and fatten operations is that they food conversion ratio of 12 or 15 to one is based on feeding the tuna wet food rather than nutritionally balanced dry food pellets. Other aquaculture operations have achieved the ratio of two pounds of feed to one pound of growth or less based on a pelletized nutritionally balanced diet. This is not uncommon in the aquaculture industry.

In your letter, you state that "HOTI says it can minimize wild fish input by using feed that will be composed of 85% soy or other protein, 1 percent vitamins, and 15 percent fish meal or oil. What is the true ratio of ingredients? These percentages add up to 101 percent. What percentage of fishmeal versus fish oil? Will soy be GMO?

The fish feed proposed to be used in the operation is pelleted fish feed that will be specially designed and produced according to exacting standards prescribed by the company. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will specify the exact requirements for its feed to the supplier. At this

time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The 101% total is due to rounding error. The company will also seek to identify local alternatives for its feed which may include algae protein and Omega 3 and 6 fatty acids. The company has no plans to use GMO soy.

4. Marine mammals/animals

In your letter you refer to the statement in the DEIS that "all outcomes on dolphins and other marine mammals are unknown at this point" (p. 2-65) and state that "This is highly inadequate." While it is true that some outcomes are known, there are still other outcomes that are unknown. To get the latest information on marine mammal interactions with open ocean aquaculture, additional consultation was carried out with the managers of Kona Blue Water Farm about their experience. This additional language was added to the EIS Chapter 2.5 Biological Resources section on dolphins and other marine mammals. The NMFS DEIS comment letter included some additional information on the issue of dolphins at Kona Blue Water Farms, as well as additional information on other dolphin species to include in the DEIS.

The Kona Blue Water Farms (KBWF), Final Supplemental Environmental Assessment (FSEA), p. 34 describes the incidence of dolphins at the farm site:

"The shoreline areas of Makiki Bay and Ho`ona Bay, south of Unualoha Point, are also frequented by spinner dolphins (*Stenella longirostris*). Because of the marine mammal protection concerns (legal, cultural, and public policy issues), the existing status of dolphins in the area and the potential impacts from the farm operations were reviewed extensively in prior EAs (see 2007 Final EA, Section 5.2.2 c). However, there is no evidence of any interaction whatsoever between spinner dolphins and the farm operation, and these concerns are not reviewed here.

Bottlenose dolphins (*Tursiops truncatus*) are now present around the net pens on a regular basis. Kona Blue staff monitors and report on dolphin activity to HIHWNMS and NOAA's PIRO PRD. A recent activity report is attached as Appendix 2. The bottlenose dolphins are probably attracted to the farm site by a combination of (i) the presence of the midwater structures acting as Fish Aggregating Device and the associated fish community that is present around the net pens; (ii) the occasional provisioning from "leakage" escapes when divers enter or exit a net pen, and from the rare larger escape incidents when predators have breached the existing Dyneema® nylon webbing on the Sea Station net pens, and (iii) interaction with divers outside of the net pen, as the divers move about the farm from boat to net pen and back.

It appears that no single individual bottlenose dolphin has taken up permanent residence at the farm site. There are no animals present on the farm site on around one-quarter to one-third of days. Even when animals are present, they are often only there for part of the day, rather than the entire day. In October-November, 2008, for example, dolphins were present for some period of time on 22 days out of 34 days (see Appendix 2: Marine Mammal Report form Kona Blue to NOAA, dated 11/26/08). There were dolphins present at the farm site, therefore, for some or all of the day on 65% of the days. On 35% of the days, then, there were no dolphins reported as observed on the site. On only one day were six dolphins present. Most other days there were one or two animals were present for some portion of the day.

Other dolphin species may be found in and around the proposed farm lease area, but are usually most commonly seen on the ‘grounds’. Spotted dolphins (*Stenella attenuate*), rough-toothed dolphins (*Steno bredanensis*), and false killer whales (*Pseudorca crassidens*) have all been observed on the ‘grounds’, or in other offshore waters of the Kona Coast.” (KBWF, FSEA, 2009, p. 34)

The KBWF FSEA 2009, p. 42 describes the potential impacts and mitigation measures to deal with dolphins:

“The proposed reduction in the number of net pens, the reduced risk of marine mammal entanglement or net pen breach with use of hard plastic mesh, and (for surface net pens) the elimination of leakage from divers entering cages through zippers, and the reduced presence of divers outside of the net pens, should all reduce the attractant nature of the farm to the bottlenose dolphins. If these proposed changes are as effective as Kona Blue anticipates, then there should result in fewer bottlenose dolphins around the net pens on fewer days. At a minimum, there will be less potential for interaction between the bottlenose dolphins and divers or farmed fish, as there are fewer net pens to tend.

Kona Blue will continue with the ongoing monitoring and reporting of marine mammal activity around the farm site, and is collaborating with HIHWNMS staff PIRO PRD staff, and UH Hilo faculty to develop a more robust third party on-site monitoring program, and to obtain funding for such research and educational activities. This data collection should then allow, going forward, an assessment of the impacts of the changes in form of net pens and mesh material.

The pattern of migration by spinner dolphins (*Stenella longirostris*) through the area suggests that the proposed amendment to the fish farm operation will not interfere in any discernible manner with the animals’ movements. The proposed farm modifications have no direct overlap with the main spinner dolphin rest area in Makako Bay, and should have no impact on these animals. The relatively small physical structures of the farm do not inhibit the movement of the animals to their offshore feeding sites. The rigid plastic webbing on the proposed net pens represents no entanglement threat to the spinner dolphins.” (KBWF, FSEA, 2009, p. 42)

The KBWF FSEA 2009 summarizes the interactions with dolphins on page 28, as follows:

Over the last two years, the existing farm operation has demonstrated a propensity to attract Bottle-nose Dolphins (*Tursiops truncatus*). No bottle-nose dolphins were previously present on the farm site, but the animals have begun to appear regularly at the site since about October, 2006. Current patterns of dolphin movement can be best characterized as one or two animals, every day or so, with occasional instances of groups of up to seven or eight animals. There is no regularity to the animals’ appearance on the farm site: they may be present all day, or only in the morning, or only in the afternoon. The animals appear to be preying on ‘opelu and other wild fish around the net pens, and will quickly attack any escapee that may ‘leak’ out of a zipper as divers enter or leave a net pen. Dolphins will also attempt to interact with divers as they move from boats to net pens. However, no one individual animal has taken up residence and the overall long-term impacts on the animals is difficult to discern at this stage. These proposed

amendments to the operating plan also should help alleviate the attractive nature of the farm to the dolphins, by reducing the potential for catastrophic escapes, and for leakage escapes, and – surface net pens are deployed – by significantly reducing the amount of time that divers need to operate outside of the net pens.” (KBWF, FSEA, 2009, p. 28).

Regarding sharks, the KBWF FSEA 2009 addresses this on p. 43 as follows:

“A detailed description of the experience on the farm managing sharks has been presented in the prior 2007 Final EA. The single overarching aspect of shark interaction with the existing fish farm site has been the general lack of shark presence around the net pens. For the first eight months of operation, only one fleeting shark sighting occurred: a small tiger shark. There are generally brief influxes of tiger sharks (mano: *Galeocerdo cuvier*) to the area in the months of September and October of each year. Most of the animals at this time appeared individual, or in pairs, with a range of sizes from 8 ft to 15 ft in length, and appear to not take up residence on the farm site. This is further confirmed by data from the DAR shark transponder receiver station on the farm site: tiger sharks only very infrequently pass by the site, and rarely do they show any interest in the operation. From July, 2006, to May, 2007, there were a total of eight (8) records of tagged tiger sharks in the Kona Blue farm area. None of these sharks took up residence. One animal passed by the farm site three times in two months, another animal was recorded twice in two months, and three other animals had single records. (Figure 4).

There have also been sightings of sandbar sharks (mano: *Carcharhinus plumbeus*) around the net pens. Initially, there were rare (none in the first year of operation), but since October, 2006, the frequency of sightings and number of sandbars has increased. These animals are usually seen in small groups (one to four sharks), below the net pens at depths of over 100 ft. They rarely rise up to the level of the net pens. Because these animals are more secretive, and cannot readily be distinguished by any markings, it is unclear if these are always the same individuals, or if they represent a larger population of animals that periodically move through the area.

In the period from June to August of 2008 there were a series of breaches of varying sizes in the Dyneema® webbing, resulting in escape incidents from primarily two of the existing Sea Station net pens. Breaches were sealed immediately on discovery. Escapees were heavily preyed upon by ulua and bottlenose dolphins and no reports were obtained from divers or fishermen of any *Seriola* being noted along the near shore waters near Keahole Point. The discrete timing of these breaches suggests they were probably due to a single predatory animal. While the incidents ceased early in September, the evident vulnerability of the present form of Dyneema® to attack, and the risk of further conditioning of the bottlenose dolphins added impetus to the plans by Kona Blue to change to a more secure webbing material. A hardened Dyneema® is now under development by Ocean Spar – manufacturer of Sea Stations Kikkonet has been used in *Seriola* waters by sea-cage barramundi farmer in North Queensland, Australia. We therefore anticipate that the use of Kikkonet webbing will reduce mesh breaches to negligible levels – possibly approaching zero. This will then significantly reduce the attractant nature of the escapes to the bottlenose dolphins.

Overall, the evidence from Kona Blue site confirms that there will be no negative impacts from any aggregating effects of the new net pens on sharks. With fewer net pens, unchanged or reduced biomass in the net pens, and easier retrieval of mortalities from the surface net pens, we expect that there will be a reduction in the attractant nature of the operation to sharks.” (KBWF, FSEA, 2009, p. 43)

In your letter, you state that “...it is unclear how the farm will affect migration patterns as whales traverse the site.”

As stated in the DEIS (p. 260), “As there are no mooring lines attaching these platforms to the seafloor, and given that the first proposed site is in 1,320 feet (402 meters) of water and 3 miles (2.6 nautical miles) from land, and the alternative is in 5,800 feet (1,768 meters), and 3 miles (2.6 nautical miles) from land, whales will easily be able to move around the platforms.”

Further, the DEIS states (p. 260), “By contrast, submersible platforms are designed to keep fish enclosed within the platform. There are no flat walls, funnels, or bottlenecks in the platform designs. The platform surface is primarily taut mesh, more akin to a vessel hull than to a transparent, yielding gill-net. The platforms are streamlined to reduce drag through the water, and they are strutted to maintain very high tension on the net material. The platforms present a hard rounded surface to an approaching animal, which would naturally tend to deflect the animal in one direction or the other, rather than halt their progress, as might a flat wall or funnel net. To visually orienting marine mammals such as humpbacks, this mesh would probably appear to present almost a solid surface. The more appropriate comparison would therefore be the interaction between anchored ships and humpback whales, rather than fishing gear and whales. Celikkol (1999) analyzed the entanglement risk of various components of Sea Stations OOA platforms (including mooring array, which is not relevant for the proposed action) and concludes, “The platforms (themselves) do not impose any known whale entanglement risk.”

As is noted in the EIS chapter 2.5 on Biological Resources section on humpback whales (p. 2-60 & 2-61 DEIS), the proposed site is at least one mile from the Hawaiian Islands Humpback Whale National Marine Sanctuary. “The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the near shore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small mesh platforms, there is no risk of entanglement by whales in the platforms.... The risk of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of Open Ocean in which the whales can maneuver around the platforms (247 acres), the spherical shape of the platforms, and the depth at which the platforms are stationed.”

As is noted in the EIS chapter 2.5 on Biological Resources section on humpback whales (p. 2-60 & 2-61 DEIS), the proposed site is at least one mile from the Hawaiian Islands Humpback Whale National Marine Sanctuary.

“The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the near shore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small mesh platforms, there is no risk of entanglement by whales in the platforms.... The risk of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of open ocean in which the whales can maneuver

around the platforms (247 acres), the spherical shape of the platforms, and the depth at which the platforms are stationed.”

As stated in the Hawaii Oceanic Technology EIS, Section 2.5 Biological Resources, (p. 2-65 DEIS),
“A monitoring program will be established as part of this project to watch for any adverse affects that may occur. If any adverse affects are identified project operations will be modified to minimize those effects. Consultation with appropriate federal agency officials will guide the protocol for managing and monitoring any interactions between employees and marine mammals. Impacts are expected to be less than significant with this monitoring in place.

The conclusion about the level of impact on marine mammals is drawn from the experience that Kona Blue Water Farm has had, as well as the design of the Oceansphere technology that incorporates improvements to reduce the attraction of the Oceansphere and its operations to dolphins. According to the KBWF Final Supplemental EA (p. 34), there is no evidence of any interaction whatsoever between spinner dolphins and the farm operation. The KBWF FSEA (p. 34) states that the bottlenose dolphins present at their net pens are probably attracted to the farm site by a combination of three factors: (1) the presence of midwater structures acting as FADs, (ii) the occasional provisioning from “leakage” escapes when the net pens are opened for divers to enter or exit the net pen, and (iii) interactions with divers outside the net pen. While the Oceansphere will likely act as a midwater FAD, the design of the Oceansphere addresses the two other factors that attract dolphins. The Oceansphere avoids escapes by bringing the Oceansphere to the surface for harvest and maintenance operations which will avoid subsurface escape passages, and allow divers to enter or exit directly into the Oceansphere, thereby reducing any time spent by divers outside the Oceansphere. Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh.

In your letter, you state that “Also, the DEIS notes that sharks around the cage may need to be killed and removed in order for the operation to be successful. Sharks are revered in Hawaiian cultural lore as an aumakua, a family guiding spirit or totem, so this would raise cultural sensitivity issues.”

Hawaii Oceanic Technology did not state in the DEIS that any shark would be killed. The EIS discusses the alternatives, other than killing, to keep sharks from the aquaculture operation. These procedures are included in the “Shark Safety Plan” included in the EIS that would involve equipping the divers with nonlethal “shark pokers” to deter shark interactions. If anyone shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP Operations and/or the President. Prior to any further action, consultation with the DLNR DAR would be done to determine any baiting, hooking and/or tagging that would be done “to discourage the shark from visiting the area.” (DEIS p. 2-67). Hawaii Oceanic Technology is very sensitive to the cultural significance of sharks. It is for this

reason that the EIS and the accompanying Cultural Impact Assessment state that to Hawaiians, sharks are considered a sacred animal, an aumakua or guardian spirit, and is considered a member of their ohana.

5. Cumulative Impacts

In your letter you note that “Little is known about long term effects of fish farm effluent on the marine environment, especially the cumulative impacts from locating multiple farms in one area. If the Ahi aquaculture project is approved, there will already be two farms (including Kona Blue) in the area, and FWW has been informed there are other companies making plans to apply for farms after HOTI. Hawaii must decide if the islands really want to open the door to this increasing industry before all impacts are understood and scientifically verified.”

The EIS Chapter 2.1.4 on Cumulative Impacts Analysis does disclose that Kona Blue Water Farms is already operating in Kona. However, the water quality model and current study results discussed above in section 2, related to “Size” indicate that the water quality impacts would not be significant outside the zone of mixing. The Kona Blue Water Farm site is far enough away from the proposed Hawaii Oceanic Technology site that there would be no combined impact to water quality in the marine environment. Hawaii Oceanic Technology farming operations have been designed from the very beginning to serve as a model for environmentally responsible open ocean aquaculture. We plan to identify and establish best practices that can be adopted by other companies operating in Hawaiian waters.

6. Cultural Conflicts and disruption to fishermen

In your letter, you state that “FWW understands that the Kanaka Council considers this DEIS to be inadequate to traditional, cultural and religious rights.”

Hawaii Oceanic Technology has responded to this issue in our response to the letter from the Kanaka Council. Please see the appendix.

In your letter you state that, “In addition to the conflict with sharks...this farm poses serious threats to traditional fishermen.”

No fishers are projected to lose their livelihood as a result of the ahi aquaculture project.

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this area for many decades were interviewed: Eddie “Lala” La’au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing KO’a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

Chapter 2.11 on Cultural Resources section on impacts (DEIS, p. 2-127) states that “Fishermen would troll along the 30-40 fathom contour for ono, mahimahi or other target species, which places the trolling lanes over two miles from the proposed ocean lease site. Bottom fishing for onaga in the area of the ocean lease site extends out to about 150 fathoms, which places the closest bottom fishing area about one mile from the proposed ocean lease site (Fukuyama).

You state that “there is inadequate native Hawaiian input concerning the cultural assessment.”

The DEIS Cultural Impact Assessment includes interviews with individual native Hawaiians who are currently cultural practitioners with personal knowledge of the area because of a lifetime of work on the water (former Kawaihae Harbormaster William Akau and opelu fishermen Lala La'au), or on the adjacent coastal lands for camping, fishing, and carrying out other cultural practices (Kimo, Bernard and Leina'ala Ho'opai, Michael Hanohano). Please see section 2.0 of the Cultural Impact Assessment for a description of these individuals.

In your letter, you state that "...there is insufficient information to prove that traditional fishing rights do not exist in the proposed site....it fails to adequately discuss how these (opelu ko'a) might be affected by the project."

As described in the Cultural Impact Assessment and the EIS, "It's important to recognize that according to records of all registered fisheries in the office of the Territorial Surveyor, none were located off Ki'iokalani ahupua'a, or other ahupua'a in the Pu'u Ulaula region of North Kohala. So, there are no legal konohiki rights or registered fisheries in the area." (p. 2-116, DEIS). In addition, Murakami and MacKenzie describe the 1839 law passed by King Kamehameha III called "An Act to Regulate Taxes" in their book, Native Hawaiian Rights Handbook (1991, p. 175) saying that the konohiki, or overseers of ahupua'a...was given the right to regulate fishing in the waters adjoining his ahupua'a "from the beach at low watermark to the edge of the reefs and, where there was no reef, to one mile seaward of the beach." (DEIS, p. 2-110). These two historical facts were the basis of the determination that there are no konohiki rights in the project area.

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing KO'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

You note that this aquaculture operation will be a FAD. You state that "If it's a FAD and attracts opelu, "would not this disruption be considered damaging to traditional fishing practices?"

As analyzed in the EIS, section 2.5, the Oceanspheres are expected to act as a Fish Aggregating Device, and would attract some species of fish, such as ono and mahi mahi.

7. Economic Impacts

In your letter, you state that the DEIS fails to sufficiently prove claims that beneficial impacts for socioeconomic conditions were identified. The huge farm only plans to employ 22 full time staff by year five of the operation.

Standard socioeconomic analytical tools were used to determine impacts. As described in Section 2.9.2 of the EIS, Section on "Factors Considered for Impacts Analysis" the "Factors 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 Hawaii 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; and
- Result in risks on the health and safety of children. (DEIS p. 2-93)

Table 2.9-4 (DEIS p. 2-93) summarizes impacts on socioeconomics. Alternative 1 and Alternative 2 would have beneficial effects on the local economy, with increases in employment, income, and business sales volume from the Ahi Aquaculture Project. Environmental Justice will be impacted positively by the availability of jobs at all educational levels. In addition to full time employees the company also expects to contract for a variety of services that will provide additional employment.

Public comment letters on the DEIS include letters from company investors who strongly believe that this business will provide needed economic development for the state’s economy. In addition, numerous individuals who work in the maritime industry or fishing industry or know people who work in the industry testified that this project would provide much needed employment in the maritime industry (Please see DEIS public comment letters from Wilson, Kopra, Wilson, Daw, Jardine, Kramer, Hirata, Malan, Kraul, Fulmer and others in the appendix)

You note in your letter that “...it will not contribute significantly to local food-security; primary markets for HOTI ahi will be in California and Japan. It is disingenuous to say this will help provide US with more domestically produced seafood when HOTI actually plans to export product to countries like Japan for a higher dollar.”

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the state in terms of taxable export revenues, the company’s employees and investors which are primarily based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company does not want to hurt local fisherman who also catch high value tuna this is sold locally but also exported to Japan and the mainland. Hawaii only consumes 3,000 tons annually of tuna of which 80% is imported. From a sustainability stand point the company would be happy to provide tuna to the local market to reduce imports so long as it does not have a negative impact on local fishermen.

8. Conclusion

In your letter, you conclude that DEIS fails to provide adequate information about the new technology used; the source and components of the massive amount of feed that will be purchased and discharged into the ocean; impacts on marine animals; and it also fails to prove the environmental or cultural impacts can be mitigated. You recommend that DLNR reject this DEIS and not to move forward with Hawaii Oceanic Technology’s proposal at this time.

For each of these concerns, please find responses provided above organized by topic as follows:

1. New Technology
2. Size
3. Feed

4. Marine mammals/animals
5. Cumulative Impacts
6. Cultural Conflicts and disruption to fishermen
7. Economic Impacts

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Sincerely,



William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., #2902
Honolulu, HI 96813

copy for: DLNR, Office of Conservation and Coastal Lands
Contact: Laura Thielen

MAUI TOMORROW FOUNDATION, INC.

Protecting Maui's Future

April 6, 2009

Mr. Bill Spencer, Executive Officer
Hawaii Oceanic Technology
425 South Street, Suite 2902
Honolulu, Hawaii 96813
Fax: 808.528.4751

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- Judith Michaels
Secretary
- Lance Holter
- Richard Michaels
- Maury King
- Elle Cochran
- Michael Duberstein
- Nat Nishiki
- Irene Bowie
Executive Director

RE: Comments on Hawaii Oceanic Technology Ahi Aquaculture Project

Aloha Mr. Spencer;

Maui Tomorrow Foundation, Inc. wishes to comment on the draft Environmental Impact Statement for Hawaii Oceanic Technology's Ahi Aquaculture project. The plan to use 247 acres off the north Kohala coast of the island of Hawaii to hold 12 orb-like cages for growing tuna for export raises many concerns and is inadequately addressed in this document.

Environmental, Social, and Economic Issues

Because Hawaii Oceanic Technology's farming facility would take up such a large area off the north Kohala coast (247 acres), conflicts of interest involving use of fishing grounds for both recreational and commercial fishermen are likely. Fish farming tends to bring the price of fish down because these farms produce such an abundance of fish and flood the market. Fish farm companies are able to charge less for their product due to cheaper overhead costs when compared to the expenses related to commercial fishing operations (pursuing wild fish) due to fuel costs and crew time. Recreational and charter boat operations suffer due to a loss of customers as these farms take up space and pollute the water and wild fish stocks.

In spite of the above-mentioned lower overhead costs, this industry has failed to demonstrate that ocean fish farming is financially sustainable as most existing farms have been found to require large amounts of funding from government or other sources in order to continue operations.

MAUI TOMORROW FOUNDATION, INC.

"Protecting Maui's Future"

Environmental sustainability is also suspect as fish wastes, excess food, fish escapes, antibiotics, and various chemicals from the farm may result in water pollution, harming surrounding habitats and wildlife. Recent studies by the University of Hawaii at Manoa further confirm that ocean fish farming is detrimental to wild fish and other marine life. Their findings showed a loss of food at the bottom of the ocean food chain due to the use of wild fish as feed. The transmission of diseases and parasites passed from the farmed fish to the wild stocks also proved problematic. Hawaii Oceanic Technology states that it can reduce the wild fish used as feed by replacing it with 85% soy in the farmed fishes' diets (10,200 tons annually) yet increased use of soy has led to damaged environments and communities worldwide and is, therefore not considered a sustainable practice.

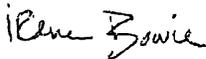
Hawaii Oceanic's proposed new cage technology is unproven regarding impacts placed on the marine environment. The project's twelve round cages, each approximately the area off 33 Olympic-sized pools combined, are to be placed un-tethered throughout the 247 acres of the ocean lease site. These cages are to be self-powered and float on their own, using a mechanism that keeps them in place by sucking sea water from below. More research is needed to determine what, if any, detrimental effects this suction might place on benthic and pelagic organisms.

Fishermen are concerned that wild fish may be attracted to these "Oceanspheres" and leave areas they usually inhabit causing a disruption in the migration patterns of bottom fish. There is also a real concern that sharks may be drawn to the cages.

Hawaii Oceanic Technology fails to adequately address the impacts on marine life in its draft environmental impact statement and admits to "a degree of uncertainty with regards to the severity (intensity and frequency) of the co-location on predator/prey species."

Maui Tomorrow Foundation asks that further information and research be conducted in order to understand and mitigate potential consequences before this project is allowed to go forward.

Sincerely,



Irene Bowie, Executive Director

Cc: Office of Environmental Quality Control, 235 South Beretania Street, Suite 702, Hon, HI 96813
DLNR, Office of Conservation and Coastal Lands, 1151 Punchbowl Street, Hon, HI 96813;
contact: Laura Thielen
Tetrattech, 737 Bishop St., Suite 3020, Hon. HI 96813 contact: George Redpath

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

Irene Bowie
Maui Tomorrow Foundation, Inc.
P.O. box 299
Makawao, HI 96768

Aloha Ms. Bowie:

Thank you for your letter dated April 6, 2009 providing comments on the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. In your letter, you provide a series of comments and some specific questions. This letter will provide a response to each question following the categories in your letter. Your question is presented first in bold face font. Then, in regular font following each question, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. "...conflicts of interest involving use of fishing grounds for both recreational and commercial fishermen are likely."

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as 'opelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'opelu, but that it would not have a permanent effect on the 'opelu fishery. There was agreement that the platforms would probably attract mabi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mabi and ono. (DEIS, p. 2-128)

2. “Fish farming tends to bring the price of fish down because these farms produce such an abundance of fish and flood the market. Fish farm companies are able to charge less for their product due to cheaper overhead costs when compared to the expenses related to commercial fishing operations (pursuing wild fish) due to fuel costs and crew time. Recreational and charter boat operations suffer due to a loss of customers as these farms take up space and pollute the water and wild fish stocks.”

Data from the aquaculture industry reflect a different economic scenario than the one you describe. The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the state in terms of taxable export revenues, the company’s employees and investors which are primarily based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company does not want to hurt local fisherman who also catch high value tuna this is sold locally but also exported to Japan and the mainland. Hawaii only consumes 3,000 tons annually of tuna of which 80% is imported. From a sustainability stand point the company would be happy to provide tuna to the local market to reduce imports so long as it does not have a negative impact on local fishermen.

3. “...this industry has failed to demonstrate that ocean fish farming is financially sustainable as most existing farms have been found to require large amounts of funding from government or other sources in order to continue operations...”

Hawaii Oceanic Technology has studied the experience of other aquaculture operations, learning about the challenges and solutions they devised. The lessons learned by these other company's informed the technology design of the Oceanspheres as an untethered self-powered submerged open ocean aquaculture platform. As noted in the DLNR Division of Aquatic Resources comment letter on the DEIS, “there are many aspects of this project which seemingly typify what an ideal offshore aquaculture venture would be. The untethered cages, autonomous feeding, energy production and propulsion systems, and the stocking of cages with cultured fish from locally captured wild brood stock. To be sure, there are many technological challenges inherent in this project, and to the best of my knowledge, there is nothing similar to it anywhere else in the world.” (See the letter in the appendix to the FEIS). Based on these new designs, Hawaii Oceanic Technology is confident that its business model will be a success.

4. “Environmental sustainability is also suspect as fish wastes, excess food, fish escapes, antibiotics, and various chemicals from the farm may result in water pollution, harming surrounding habitats and wildlife.”

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that, “Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes’ metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mail) distance from coral reefs and 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.”

The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of

high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, “At the site locations many of the issues about water quality, bottom impacts and entanglement would be nonexistent.” (Please see UH Environmental Center letter in the appendix).

The ocean current study in the EIS Appendix B concludes on page 11 stating, “The proposed site has relatively weak long-term average flows, and is frequently subject to strong transient motions associated with eddies. The proposed site is in a region that is exposed to strong positive wind stress curl, which drives upwelling and the development of cyclonic mesoscale eddies. These eddies retain their coherence for much shorter times than the anticyclonic eddies that form further to the south in the lee of Hawaii (Calil et al., 2008). Thus they tend to be more dispersive than the average of both cyclonic and anticyclonic motions studied by Lumpkin (1998).” (Lukas 2008, p. 11).

“Strong vertical shears are usually found in these eddies, causing strong vertical mixing (Eden and Greatbatch, 2008). This vertical mixing combined with the horizontal dispersion associated with the mesoscale and submesoscale eddies, suggests that the proposed site is in an ideal region to minimize accumulation of by-waste products from open-ocean aquaculture.” (Lukas 2008, p. 11).

“Should an accumulation of by-waste occur, it will very likely be dispersed within a few days (Table 1), as the strong cross-flow concentration curvature increases dispersion. An accumulation of by-waste will also likely be reduced through neglected sinks (e.g., consumed by phytoplankton and zooplankton).”(Lukas 2008, p. 11).

5. Concerns about fish feed.

The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The company has no plans to use GMO soy. The company plans to produce the highest quality ahi, suitable for sashimi. When the NOSB finalizes its organic standards, Hawaii Oceanic Technology plans to follow its requirements for organic aquaculture. Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources. The company has begun discussions with possible suppliers who might eventually have the capability to meet our supply requirements, but has not finalized any contract to source the feed components locally, yet.

6. Concerns about technology and impact of deep seawater pipe on benthic and pelagic organisms.

As described in the FEIS, the technological design has been modified to remove the deep seawater pipe. Even so, the EIS Chapter 2.4 on Water Quality states in Section 2.4.2 on Environmental Impacts that “Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

7. Concerns about impacts on fishermen.

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as 'opelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'opelu, but that it would not have a permanent effect on the 'opelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono. (DEIS, p. 2-128)

8. Concerns about sharks being attracted to the site.

Our Best Management Practices goal is to avoid predator interactions. Sharks and other pelagic predators will be attracted to the activities associated with off shore cage culture. We will avoid contact with these pelagic predators by denying them a food source by the use of impenetrable cages and netting materials, video monitoring of feedings, and a wildlife monitoring and reporting system to meet DAR/DLNR protocol.

Kona Blue has recorded only rare instances of tiger sharks around its existing farm; probably related to seasonal migrations. For the first eight months of operation, only one fleeting shark sighting occurred: a small tiger shark. There are generally brief influxes of tiger sharks (mano: *Galeocerdo cuvier*) to the area in the months of September and October of each year. Most of the animals at this time appeared individually, or in pairs, with a range of sizes from 8ft to 15ft in length, and appear to not take up residence on the farm site. This is further confirmed by data from the DAR shark transponder receiver station on the farm site: tiger sharks only very infrequently pass by the site, and rarely do they show any interest in the operation. From July, 2006 to May, 2007, there were a total of eight (8) records of tagged tiger sharks in the Kona Blue farm area. None of these sharks took up residence. One animal passed by the farm site three times in two months, another animal was recorded twice in two months, and three other animals had single records.

Use of the hardened Dyneema® or Kikkonet rigid plastic net pen mesh should further reduce attractant nature of the farm, and reduce or eliminate breaches in the mesh.

Thank you for your comprehensive comments on the DEIS.

Sincerely,

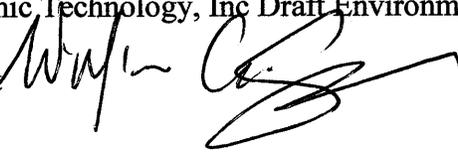
A handwritten signature in black ink, appearing to read 'W.A. Spencer', with a long horizontal flourish extending to the right.

William A. Spencer, CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

Date: May 21, 2009

To: Commenter on Hawaii Oceanic Technology, Inc Draft Environmental Impact Statement
From: William A. Spencer, CEO
Subject: Ahi Aquaculture Project



Aloha,

Thank you for your email dated March 26, 2009 providing comments on the Hawaii Oceanic Technology Ahi Aquaculture Project.

In your email, you provide a series of comments. This letter will provide our response to these comments. Your comment is summarized first in bold face font. Then, in regular font following each comment, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. I have significant concerns about the DEIS of HOT, Inc. the proposed lease site is three times any existing ocean fish farming operation in Hawaii and aims to produce forty eight times more fish than another local farm it claims to be similar to. The DEIS fails to sufficiently address the effects of the proposed farm on wild fish populations...

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

2. ...conflicts with marine mammals and endangered species

As stated in the DEIS (p. 260), "As there are no mooring lines attaching these platforms to the seafloor, and given that the first proposed site is in 1,320 feet (402 meters) of water and 3 miles (2.6 nautical miles) from land, and the alternative is in 5,800 feet (1,768 meters), and 3 miles (2.6 nautical miles) from land, whales will easily be able to move around the platforms."

Further, the DEIS states (p. 260),

"By contrast, submersible platforms are designed to keep fish enclosed within the platform. There are no flat walls, funnels, or bottlenecks in the platform designs. The platform surface is primarily taut mesh, more akin to a vessel hull than to a transparent, yielding gill-net. The platforms are streamlined to reduce drag through the water, and they are strutted to maintain very high tension on the net material. The platforms present a hard rounded surface to an approaching animal, which would naturally tend to deflect the animal in one direction or the other, rather than halt their progress, as might a flat wall or funnel net. To visually orienting marine mammals such as humpbacks, this mesh would probably appear to present almost a solid surface. The more appropriate comparison would therefore be the interaction between anchored ships and humpback whales, rather than fishing gear and whales. Celikkol (1999) analyzed the entanglement risk of various components of Sea Stations OOA platforms (including mooring array,

which is not relevant for the proposed action) and concludes, “the platforms (themselves) do not impose any known whale entanglement risk.”

As is noted in the EIS chapter 2.5 on Biological Resources section on humpback whales (p. 2-60 & 2-61 DEIS), the proposed site is at least one mile from the Hawaiian Islands Humpback Whale National Marine Sanctuary.

“The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the near shore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small mesh platforms, there is no risk of entanglement by whales in the platforms.... The risk of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of Open Ocean in which the whales can maneuver around the platforms (247 acres), the spherical shape of the platforms, and the depth at which the platforms are stationed.”

As stated in the Hawaii Oceanic Technology EIS, Section 2.5 Biological Resources, (p. 2-65 DEIS),

“A monitoring program will be established as part of this project to watch for any adverse affects that may occur. If any adverse affects are identified project operations will be modified to minimize those effects. Consultation with appropriate federal agency officials will guide the protocol for managing and monitoring any interactions between employees and marine mammals. Impacts are expected to be less than significant with this monitoring in place.

Here is the section from the DEIS (pp. 2-65-2-66) that discusses your question:

Monitoring Program

- *Monitoring by qualified observers, preferably by third-party qualified biological resource personnel, of spinner dolphin and other marine mammal species (and sea turtles) in the area of the platforms would be required to ensure no deleterious effects of any kind result from interactions (particularly unforeseen) with the platforms.*

- *Reports of all monitoring will be distributed to agency personnel and research groups.*

- *Surveying should be done daily by cleaning and maintenance personnel of Hawaii Oceanic Technology, however, surveying also should be done at least once a week initially, with surveys decreasing in frequency once quantified data show less than significant effects are occurring.*

- *All on-site project personnel will be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal and state laws.*

- *Local marine wildlife experts and agency personnel will be contacted and informed of the impending work that exceeds daily and routine maintenance; in addition, wildlife experts and agency personnel must be immediately contacted in the event of any marine wildlife concerns, including collisions, strikes, or entanglements that may occur during the project.*

- *Preparation and presentation of a Marine Mammal Monitoring Plan will be incorporated into the project design.*

Sharks. In meetings with the public, special interest groups, and various other forums, there has often been concern expressed about the potential for the platforms of the proposed operation to act as FADs and thus, via increasing fish species in a localized area, increasing the likelihood of sharks in the area. Although

increasing fish species offers great potential benefits to fishermen, as discussed above, it is also recognized that the FAD action of an OOA operation may attract sharks to the area. In addition, sharks may be drawn to the platforms because of a greater availability of food (either from the excess fish food, from the visibility of the fish inside the platforms, from the scent of dead fish in the platforms, or because of the greater biomass of other fish outside the platform). The impact on biological resources or on humans from increased shark presence in the location of the proposed project would have to be studied and potentially mitigated.

While it is possible that if sharks are drawn to the platforms, it could lead to increased predation on dolphins or other marine mammals in the area, there are no recorded instances. The likelihood of different species being located in the same area at the same time would increase as a result of the presence of the platforms and all observations will be recorded per the monitoring program.

An increase in resident sandbar sharks (*Carcharhinus plumbeus*) did occur in the second stage of the Ewa Beach platform trials, though not in the initial series of experimental platforms. Randy Cates (owner and operator of the moi farm offshore of Ewa Beach) suggested that based on his observations; there will be no aggregating effects of the platform on sharks (pers. comm.). There is no quantifiable evidence showing an effect or no effect. Therefore, it is not known if sharks may be aggregated to the platforms, and if so, if this would mean an actual increase in the number of sharks in the overall area, or just a shift in distribution of the same numbers that already occur. If sharks are drawn to the platform, they will presumably be drawn away from other adjacent areas, thereby reducing the apparent density of sharks (which might result in a decreased risk to the public from sharks). However, no conclusions can be drawn at this time as there are only anecdotal data.

As this project proposes a substantial increase in total production and number of platforms, more divers will be required to complete regular maintenance. Both the proposed and alternative sites are 3 miles (2.6 nautical miles) from land and potentially less protected from storms and dangerous sea conditions. These factors could increase the number of mortalities within the platforms as well as increase the length of time mortalities remain in the platforms, causing an increase in attraction by sharks and other predators to the platforms.

While this argument remains speculative and will require further study to determine the actual impact, the proposed project would create the opportunity for continual interactions between humans (divers) and sharks. The need to remove sharks is not incidental and in fact may be a necessary part of the success of the operation. To minimize potential impacts the following shark safety plan will be put in place as part of this project.

Shark Safety Plan (Modeled after DAR).

Divers should always be aware that sharks could appear. If a shark is sighted, the list below are procedures to be followed:

- Divers are to notify each other by hand sign (hand held fin-like on top of head) and divers are to aggregate together and face the shark.*
- Divers should try to keep their backs to the platform, buoy, boat or other obstacle.*
- Divers are not to make any sudden movements, swim away hurriedly, splash, take photographs or flash lights at the shark.*
- Divers should surface to discuss if the dive should continue as soon as it is safe to do so.*
- No dive is to continue if any diver feels uncomfortable or would prefer to abort.*

- No employee is ever expected to enter the water when sharks are around the platforms; any dive undertaken when sharks have been sighted must be at the diver's sole and absolute discretion.
- All sharks sighted are to be noted in the dive log. Record number of sharks, identifying features (species, length, distinguishing marks), behavior towards divers, and period of residence around the platforms.
- Management must be notified of these encounters.

There may be occasions when the offshore crew may have to use extra precautions with sharks. These occasions include, but are not limited to; 1) Shark at site is aggressive towards divers and other objects, 2) Shark has taken up residence or has become territorial at the site. At this point, this is defined by viewing the same shark at the site for 2 or more days in succession. All procedures mentioned above still apply. In addition, extra precautions are listed below:

- Divers/Snorkelers must add an additional diver to the team size (i.e. 3 divers instead of the normal 2).
- Divers/Snorkelers must remain within view on surface or underwater.
- One of the dive team must carry a shark "poker" (large stick) if the divers remain in close proximity (<20 ft).
- If divers are not in close proximity, every diver should have a "poker."

The diver supervisor on site is responsible for all dive operations so he/she can suspend any dive operations if they believe it is necessary. If anyone shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP, Operations and/or the President. Prior to any further action, management will consult with the local office of Division of Aquatic Resources to determine the next course of action (i.e. baiting, hooking and/or tagging) to discourage the shark from visiting the site.

Additional Conservation Measures

Monitoring and Reporting. Hawaii Oceanic Technology will undertake, at its own cost, to develop a Monitoring Plan (MP) for documenting all interactions between the project and marine mammals, sea turtles, and sharks. This will be prepared in consultation with NOAA

Fisheries. The assistance of marine mammal scientists, HIIHWNMS staff, and/or NOAA Fisheries experts will be obtained to design a program that ensures the maximum practical amount of usable information is collected and incorporated into an MP. This would be similar, though less broad in scope, to the current MP undertaken and currently in process by the US Navy, NAVFAC Pacific, for Hawaiian waters, based on recommendations by local marine mammal mitigation experts (Smultea et al. 2007). Mattila and Walters (pers. comm.) also indicated that "detailed measures of abundance or spatial distribution were not needed, but that basic records of interactions would suffice." That is, the MP will include a record of any interactions between marine wildlife and the project structures (platforms), such as any close approach of a whale, such as within 30 meters (100 feet) (as regulated by the MMPA). All Hawaii Oceanic Technology staff shall also adhere to federal recommendations or instructions in the unlikely event of any collisions, or ship strikes. The initial response will be to immediately call the NOAA Fisheries Marine Mammal Stranding Hotline (1-888-256-9840). Hawaii Oceanic Technology could work with HIIHWNMS officials to train staff in appropriate first-response measures, although liability concerns need to be addressed prior to undertaking this mitigation measure. Hawaii Oceanic Technology recognizes the complexity of these issues, with sanctuary protocols and ESA considerations, but still affirms their

willingness to assist sanctuary or NOAA Fisheries in any such manner that is deemed appropriate.

3. ...conflicts with fishermen

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as 'opelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'opelu, but that it would not have a permanent effect on the 'opelu fishery. There was agreement that the platforms would probably attract mabi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mabi and ono. (DEIS, p. 2-128)

4. ...concerns about fish feed

The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing, and will produce our feed to our exacting specifications. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The company has no plans to use GMO soy. The company plans to produce the highest quality ahi, suitable for sashimi. When the NOSB finalizes its organic standards, Hawaii Oceanic Technology plans to follow its requirements for organic aquaculture. As stated in the EIS, Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources. The company has begun discussions with possible suppliers who might eventually have the capability to meet our supply requirements, but has not finalized any contract to source the feed components locally, yet.

5. ...impacts on cultural resources

The Hawaii Oceanic Technology Draft EIS includes a Cultural Impact Assessment that is consistent with the Guidelines for Assessing Cultural Impacts adopted by the Environmental Council, State of

Hawaii on November 19, 1997. The Cultural Impact Assessment clearly presents the results of historical literature and map research, as well as interviews and close consultation with native Hawaiian kupuna with a lifelong and ancestral connection to the ocean in the general area of the proposed site, and on the coastal land adjacent to the proposed ocean lease site. Information from the Cultural Impact Assessment on traditional, cultural and religious rights are addressed in detail in the section 2.11 on Cultural Resources in the DEIS.

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie “Lala” La’au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko‘a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

Section 2.11 on Cultural Resources in the EIS states (DEIS p. 2-129): “

Among the interviewees, there was agreement on the location of cultural resources, such as ‘ōpelu ko‘a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and ‘ōpelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘ōpelu, but that it would not have a permanent effect on the ‘ōpelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono.

The analysis of cultural impacts continues on DEIS, p. 2-130, as follows,

As discussed above, to determine how the proposed activity might affect the traditional cultural values and practices associated with the adjacent land area, twelve ahupua‘a in the area were researched in the area locally known as Pu‘u ulaula (Pabinahina to Kaiboaa) and Black Point (Malae Point) (Ki‘iokalani, Puaiki and Puanui), including identifying and contacting all the known and identified cultural practitioners and kupuna, local landowners or long-term lessees, the recognized konohiki of the area and the native Hawaiian families culturally attached to the land.

For the interviewees who camped and shore fished along the shoreline adjacent to the proposed site, they were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews, each of them said it wouldn’t affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the view shed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won’t make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project’s work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho‘opai 2008, Hanohano 2008).

A primary cultural value that was stated by the Ho‘opai ‘ohana and shared by other interviewees is: “You have to take care of nature and it’ll take care of you. You need to give back. The more you give back, the

more it'll take care of you.” (Ho‘opai 2008). Bernard Ho‘opai encouraged the aquaculture farm to give back to the environment and community.

Cultural practitioners and kama‘āina with multi-generational connections to the land on the adjacent shoreline also noted no positive or negative impact of the proposed action on their activities (Ho‘opai 2008, Hanobano 2008, Akau 2008, Von Holt 2008, Richards 2008).

6. ...impacts from the self-powered cages with their OTEC that pulls up seawater from below the cage...how this affects benthic and pelagic organisms

The EIS Chapter 2.4 on Water Quality states in Section 2.4.2 on Environmental Impacts that “Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

Because the intake for the cold water pipe is located at 200m depth, and the bottom is at 400m, there would be no impact from the intake on the benthic environment. Because there is no impact on water quality, there is no expected impact on pelagic organisms.

7. ...overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the state in terms of taxable export revenues, the company’s employees and investors which are primarily based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company does not want to hurt local fisherman who also catch high value tuna this is sold locally but also exported to Japan and the mainland. Hawaii only consumes 3,000 tons annually of tuna of which 80% is imported. From a sustainability stand point the company would be happy to provide tuna to the local market to reduce imports so long as it does not have a negative impact on local fishermen.

8. HOT essentially is asking the citizens of HI to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs.

As noted in the Section 3.0 on Conformance with Public Plans and Policies Section 3.1 on “Relationship to State Statutes, Plans and Policies” on pp. 3-1 – 3-5, open ocean aquaculture is consistent with state policies. Hawaii has already decided that aquaculture should be pursued, while also meeting the high environmental quality standards required in the State of Hawaii. Hawaii Oceanic Technology is committed to this high environmental standard, as shown in the mitigation measures and monitoring programs it will implement. Hawaii has a 200,000 square mile Exclusive Economic Zone (EEZ), second largest in the United States behind Alaska, that can be enjoyed by commercial fisherman, recreational fisherman, boaters and others. As stated Hawaii law allows open ocean aquaculture which is highly regulated to meet the strictest environmental standards. Our ocean lease request and permit asks for less than one-half square mile or .00025 percent of the available EEZ to pursue a legally allowed commercial endeavor that will provide jobs, contract revenues and tax revenues to the state with an anticipated finding of no significant impact to the environment.

9. It is imperative that HOTI address many issues before a conservation lease is granted. DLNR, Tetrattech and OEQC should "hold HOTI accountable and provide the public with a more informative and thorough EIS."

Hawaii Oceanic Technology has produced a Draft EIS for which the state in its January 30, 2009 acceptance letter found to be in "conformance with Chapter 343, HRS and Chapter 11-200 , HAR and declared that "a finding of no significant impact to the environment is anticipated for the proposed project." Final EIS which has been revised to provide additional information, and respond to questions from public and agency comments that were provided on the Draft EIS is being submitted.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

List of People Using the Food and Water Watch Web Site to Send a Form Letter

First Name	Last Name	Street Address	City	State	Postal Code
Michael	Kramer	P.O. Box 390595	Keauhou	HI	96739
John	Corbin	47-215 Iuiu Street	Kaneohe	HI	96744
Virendra	Nath	58 Kahuakai Place	Lahaina	HI	96761
Chenoa	Farnsworth	Pioneer Plaza, Ste. 1800	Honolulu	HI	96813
Gregg	Hirata	55 Holomua Street	Hilo	HI	96720
Van	Malan		Kailua-Kona	HI	
Syd	Kraul	73-998 Ahikawa St	Kailua-Kona	HI	96740-9407
Adam	Daw		Hilo	HI	
Ross	Fulmer	62-2146 Ouli Street	Kamuela	HI	96743
Chales	Wilson		Kailua-Kona	HI	
Linda	Wilson	77-263 Maliko Street	Kailua-Kona	HI	96740
John	Patterson	4850 Makena Alanui	Kihei	HI	96753
David Kris	Kopra	P.O. Box 6013	Kamuela	HI	96743
Herbert "Monty"	Richards	Kahua Ranch	Kamuela	HI	96743
David	Bangert		Kailua	HI	96734
John	Wiltshire	2540 Dole Street	Honolulu	HI	96822
William	Jardine		Kamuela	HI	96743
Diane	Ley	25 Aupuni Street	Hilo	HI	96720-4252
Peter	Rappa	2500 Dole Street	Honolulu	HI	96822
Joseph	Carvalho	P.O. Box 776	Kapaau	HI	96755
Robert	Parsons	P.O. Box 791180	Paia	HI	96779
Cory	Harden		Hilo	HI	
Cory	Harden	P.O. Box 1137	Hilo	HI	96721
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Kale	Gumapac	HC2 Box 9607	Keeau	HI	96749
Eden Marie	Peart	P.O. Box 1863	Honokaa	HI	96727
Jessica	Niles	300 Maalaea Rd.	Wailuku	HI	96753
Dave	Kisor	45-223 Makahinu St	Kaneohe	HI	96744
Gail	McElrath	P.O. Box 2017	Pearl City	HI	96782
Pauline	MacNeil	112 Haokea Drive	Kailua	HI	96734
Janice	Palma Glennie	P.O. Box 4849	Kailua-Kona	HI	96740
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Rowena	Vaca	75-5773 Kaila Place	Kailua-Kona	HI	96740
Mapuana	Peterson	175 Banyan Dr.	Hilo	HI	96720
Lori	Coleman	1367 L. Kimo Drive	Kula	HI	96790
Christina	Bishop	69-D Railroad Ave. #62	Hilo	HI	96720
David	Balfour	930 S. Kihei Rd	Kihei	HI	96753
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Kirsten	Nathan	854 Blue Sky Dr.	Port Townsend	WA	98368

List of People Using the Food and Water Watch Web Site to Send a Form Letter

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Aulia	Ventura	2080 Manawalea St	Lihue	HI	96766
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R.	Erwin	P.O. Box 6302	Kahului	HI	96733
Traci	Bean	900 Haunani Pl.	Wailuku	HI	96793
Elko	Evans	3225 Pakanu St.	Honolulu	HI	96822
Alan	Bartl	512 Juilliard Park Dr.	Santa Rosa	CA	95401
Sherrie	Moore	RR 3 Box 1302	Pahoa	HI	96778
Sally	Yoshida	465 Kapahulu Ave	Honolulu	HI	96815
David	Monasevitch	4457 Laukini Rd.	Lihue	HI	96766
Kathy	Shimata	3453 Pawaina St.	Honolulu	HI	96822
Katie	Romanchuk	1401 W. Kuiaha Rd.	Haiku	HI	96708
Reyna Alejandra	Rodriguez	7293 West Desert Cove #90	Peoria	AZ	85345
Eva	Lewis	91-1480 Renton Rd. #8	Ewa Beach	HI	96706-4424
Robin	Shishido	1715 Hunnewell St.	Honolulu	HI	96822
L	Jerene	81-1081 Keopuka Mauka	Kealahou	HI	96750
Christopher	Harrison	P.O. Box 385015	Waikoloa	HI	96738
Catherine	Okimoto	RR 4 Box 2251	Pahoa	HI	96778
Dianne	Evans	44-704 Ho`ouli Street	Honokaa	HI	96727
Catherine	Hirsch	P.O. Box 755	Anahola	HI	96703
K	Chung	2318 Kipona Place	Honolulu	HI	96816
Phyllis	Bala	P.O. Box 313	Occidental	CA	95465
Anne	Staggemeier	91-1201 Keone`ula Blvd.	Ewa Beach	HI	96706
Eloise	Engman	22 Auoli Dr.	Makawao	HI	96768
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Marita	Strong	143 Pauloa Pl.	Kihei	HI	96753
Andrea	Pellicani	512 Juilliard Park Dr.	Santa Rosa	CA	95401
Liliane	Keil	Rue Luins	SY	OT	4190
JoAnne	Smith	522 Shaffer Ave	Ridgway	PA	15853
Aliaska	Brozen	3100 A Mapu Pl.	Kihei	HI	96753
Cindy	Babson	760 Kekona Pl.	Makawao	HI	96768
Carol	Maghakian	6457 Sweet Gum Trail	Myrtle Beach	SC	29588
Deborah	Notch	811 S. Kihei Rd. 1-C	Kihei	HI	96753
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Lynn	Flaming	P.O. Box 791540	Paia	HI	96779
Bruce	Benner	38 Laukahi Street	Kihei	HI	96753
Gwen	Ilaban	76-6182 Alii Dr.	Kailua-Kona	HI	96740
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Virginia	Hall	77-361 Ailina St.	Kailua-Kona	HI	96740
Michael	Swerdlow	P.O. Box 384192	Waikoloa	HI	96738
Brooke	Porter	300 Maalaea Rd.	Wailuku	HI	96793
Jim	Kastner	45-222 Lilipuna Rd.	Kaneohe	HI	96744
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List of People Using the Food and Water Watch Web Site to Send a Form Letter

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List of People Using the Food and Water Watch Web Site to Send a Form Letter

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Shawn	White	P.O. Box 2502	Honolulu	HI	96804

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

TO: Food and Water Watch Petition Signator

Aloha,

We received a copy of a Food and Water Watch petition regarding the Draft EIS for the Hawaii Oceanic Technology, Inc. Ahi Aquaculture Project. Your name is on the petition, so we would like to send you a response to the comments made in the petition itself. In the petition, there are two statements of concerns, which are presented here in bold face font. Then, in regular font following each statement, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. The DEIS inadequately addresses critical issues: untested, untethered Oceansphere fish pen systems with thermal energy exchange: fish feed conversion rations; pollution; diseases; cultural resources; and more.

The company is taking an innovative approach to solve many of the problems of alternative aquaculture systems. The propulsion system to hold the cages in geostatic position in the leased area is ecofriendly and is a very good example of hybrid renewable energy system. Much of the technology the company intends to employ has been thoroughly demonstrated, tested and is in fact in use by modern day open ocean oil drilling companies. Modern day oil rigs are unmanned and remotely operated and able to stay accurately in specific locations in a variety of currents and sea conditions. Our company is building on lessons learned from this industry and technologies that are commercially available. Our projected feed conversion ratios are similar to other aquaculture operations.

The ocean lease site that has been proposed was carefully selected based on a variety of factors related to currents, protection from winds and relatively constant calm sea conditions. The design of this project is to minimize any potential for impacts to the benthic environment by allowing the platforms to be located in 1,320 feet of water, 2.6 nm offshore North Kohala in an area of high currents and pelagic waters. As noted by the UH Environmental Center in their comment letter on the DEIS, "At the site location many of the issues about water quality, bottom impacts and entanglement would be nonexistent." (Please see UH Environmental Center letter in the appendix).

In the DEIS Section 2.4 (p. 2-40) on Water Quality it states that,

"Stocking the platforms with fish will result in some increase in nutrients and particulate matter in the water column from the fishes' metabolic wastes, feces, and any excess feed. The prevailing currents in the ROI (See appendix Current Study Report), constant mixing of the SML, placement of the platforms at 180 feet (55 meters depth), 3 mile (2.6 nautical mile) distance from coral reefs and 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."

The size of the Oceanspheres allows for a low stocking density, which reduces the potential for disease among the cultured fish.

The cultural impacts of the proposed project were carefully analyzed and described in Sec. 5.1 of the Cultural Impact Assessment. In this report, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean

area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 of the EIS on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as 'opelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'opelu, but that it would not have a permanent affect on the 'opelu fishery. There was agreement that the platforms would probably attract mabi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mabi and ono. (DEIS, p. 2-128)

2. the DEIS also includes some major discrepancies, such as citing two different amounts of optimal production capacity – 12,000 tons of fish produced annually versus 6,000 tons annually. Thanks for pointing out the typographical error. The projected annual production from the aquaculture operation is 6,000 tons.

Thank you for your interest in our project.

Sincerely,



William A. Spencer
CEO
Hawaii Oceanic Technology, Inc.
425 South St., Suite 2902
Honolulu, HI 96813

To: The Department of Land and Natural Resources
 We, the undersigned, have serious concerns about the DEIS for the Ahi Aquaculture Project, Ref # HA-3496.

OF OCEANIC FISHERIES



- The DEIS inadequately addresses critical issues: untested, unfiltered Oceansphere fish pen systems with thermal energy exchange; fish feed conversion ratios; pollution; diseases; cultural resources; and more.
- The DEIS also includes some major discrepancies, such as citing two different amounts of optimal production capacity - 12,000 tons of fish produced annually versus 6,000 tons annually.

Therefore, we urge the Department of Land and Natural Resources not to grant Hawaiian Oceanic Technologies, Inc. a conservation lease to begin their project until these issues and discrepancies have been addressed in their DEIS. Please stick up for Hawaii's people and for responsible planning.

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To: The Department of Land and Natural Resources

We, the undersigned, have serious concerns about the DEIS for the Ahi Aquaculture Project, Ref # HA-3496.

FOOD & WATER WATCH

- The DEIS inadequately addresses critical issues: untested, unthethered Oceansphere fish pen systems with thermal energy exchange; fish feed conversion ratios; pollution; diseases; cultural resources; and more.
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To: The Department of Land and Natural Resources

We, the undersigned, have serious concerns about the DEIS for the Ahi Aquaculture Project, Ref # HA-3496.

Food and Water Watch

- The DEIS inadequately addresses critical issues: untested, un tethered Oceansphere fish pen systems with thermal energy exchange; fish feed conversion ratios; pollution; diseases; cultural resources; and more.
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ARNIE KOTLER	875 7995	arnie@kookbooks.com	Kihei	-53	

To: The Department of Land and Natural Resources

We, the undersigned, have serious concerns about the DEIS for the Ahi Aquaculture Project, Ref # HA-3496.

Food and Water Watch

- The DEIS inadequately addresses critical issues: untested, unethereal Oceansphere fish pen systems with thermal energy exchange; fish feed conversion ratios; pollution; diseases; cultural resources; and more.
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Therefore, we urge the Department of Land and Natural Resources not to grant Hawaiian Oceanic Technologies, Inc. a conservation lease to begin their project until these issues and discrepancies have been addressed in their DEIS. Please stick up for Hawaii's people and for responsible planning.

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DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

FAX

To: <i>Char Laura Thicker</i>	From: <i>Chastra Lreei</i>
Fax Number:	Pages (including cover page): <i>1e</i>
Phone Number:	Date:
Re:	CC:

- Urgent
 For Review
 Please Comment
 Please Reply

Notes:

*These are being submitted for the public
comment record for the DEIS on the
Ahi Aquaculture Project Ref # HA-3496*

Hawaii Oceanic Technology
425 South Street, #2902
Honolulu, HI 96813

Date: May 21, 2009

To: Commenter on Hawaii Oceanic Technology, Inc Draft Environmental Impact Statement
From: William A. Spencer, CEO
Subject: Ahi Aquaculture Project



Aloha,

Thank you for your email dated March 26, 2009 providing comments on the Hawaii Oceanic Technology Ahi Aquaculture Project.

In your email, you provide a series of comments. This letter will provide our response to these comments. Your comment is summarized first in bold face font. Then, in regular font following each comment, a response is provided. Where useful, a reference and quote from the EIS will be provided to address the question.

1. I have significant concerns about the DEIS of HOT, Inc. the proposed lease site is three times any existing ocean fish farming operation in Hawaii and aims to produce forty eight times more fish than another local farm it claims to be similar to. The DEIS fails to sufficiently address the effects of the proposed farm on wild fish populations...

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko'a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

2. ...conflicts with marine mammals and endangered species

As stated in the DEIS (p. 260), "As there are no mooring lines attaching these platforms to the seafloor, and given that the first proposed site is in 1,320 feet (402 meters) of water and 3 miles (2.6 nautical miles) from land, and the alternative is in 5,800 feet (1,768 meters), and 3 miles (2.6 nautical miles) from land, whales will easily be able to move around the platforms."

Further, the DEIS states (p. 260),

"By contrast, submersible platforms are designed to keep fish enclosed within the platform. There are no flat walls, funnels, or bottlenecks in the platform designs. The platform surface is primarily taut mesh, more akin to a vessel hull than to a transparent, yielding gill-net. The platforms are streamlined to reduce drag through the water, and they are strutted to maintain very high tension on the net material. The platforms present a hard rounded surface to an approaching animal, which would naturally tend to deflect the animal in one direction or the other, rather than halt their progress, as might a flat wall or funnel net. To visually orienting marine mammals such as humpbacks, this mesh would probably appear to present almost a solid surface. The more appropriate comparison would therefore be the interaction between anchored ships and humpback whales, rather than fishing gear and whales. Celikkol (1999) analyzed the entanglement

risk of various components of Sea Stations OOA platforms (including mooring array, which is not relevant for the proposed action) and concludes, “the platforms (themselves) do not impose any known whale entanglement risk.”

As is noted in the EIS chapter 2.5 on Biological Resources section on humpback whales (p. 2-60 & 2-61 DEIS), the proposed site is at least one mile from the Hawaiian Islands Humpback Whale National Marine Sanctuary.

“The Proposed Action mitigates the potential impacts identified above by locating the platforms away from the near shore waters, to avoid areas frequented by marine mammals, and avoid areas where there is already trolling and fishing traffic. Given the lack of mooring lines and the taut small mesh platforms, there is no risk of entanglement by whales in the platforms.... The risk of entanglement for the proposed project is even further reduced by the lack of mooring lines, the amount of Open Ocean in which the whales can maneuver around the platforms (247 acres), the spherical shape of the platforms, and the depth at which the platforms are stationed.”

As stated in the Hawaii Oceanic Technology EIS, Section 2.5 Biological Resources, (p. 2-65 DEIS),

“A monitoring program will be established as part of this project to watch for any adverse affects that may occur. If any adverse affects are identified project operations will be modified to minimize those effects. Consultation with appropriate federal agency officials will guide the protocol for managing and monitoring any interactions between employees and marine mammals. Impacts are expected to be less than significant with this monitoring in place.

Here is the section from the DEIS (pp. 2-65-2-66) that discusses your question:

Monitoring Program

- Monitoring by qualified observers, preferably by third-party qualified biological resource personnel, of spinner dolphin and other marine mammal species (and sea turtles) in the area of the platforms would be required to ensure no deleterious effects of any kind result from interactions (particularly unforeseen) with the platforms.*
- Reports of all monitoring will be distributed to agency personnel and research groups.*
- Surveying should be done daily by cleaning and maintenance personnel of Hawaii Oceanic Technology, however, surveying also should be done at least once a week initially, with surveys decreasing in frequency once quantified data show less than significant effects are occurring.*
- All on-site project personnel will be apprised of the status of any listed species potentially present in the project area and the protections afforded to those species under federal and state laws.*
- Local marine wildlife experts and agency personnel will be contacted and informed of the impending work that exceeds daily and routine maintenance; in addition, wildlife experts and agency personnel must be immediately contacted in the event of any marine wildlife concerns, including collisions, strikes, or entanglements that may occur during the project.*
- Preparation and presentation of a Marine Mammal Monitoring Plan will be incorporated into the project design.*

Sharks. In meetings with the public, special interest groups, and various other forums, there has often been concern expressed about the potential for the platforms of the proposed operation to act as FADs and thus, via increasing fish species in a localized area, increasing the likelihood of sharks in the area. Although increasing fish species offers great potential benefits to fishermen, as discussed above, it is also recognized that the FAD action of an OOA operation may attract sharks to the area. In addition, sharks may be drawn to the platforms because of a greater availability of food (either from the excess fish food, from the visibility of the fish inside the platforms, from the scent of dead fish in the platforms, or because of the greater biomass of other fish outside the platform). The impact on biological resources or on humans from increased shark presence in the location of the proposed project would have to be studied and potentially mitigated.

While it is possible that if sharks are drawn to the platforms, it could lead to increased predation on dolphins or other marine mammals in the area, there are no recorded instances. The likelihood of different species being located in the same area at the same time would increase as a result of the presence of the platforms and all observations will be recorded per the monitoring program.

*An increase in resident sandbar sharks (*Carcharhinus plumbeus*) did occur in the second stage of the Ewa Beach platform trials, though not in the initial series of experimental platforms. Randy Cates (owner and operator of the moi farm offshore of Ewa Beach) suggested that based on his observations; there will be no aggregating effects of the platform on sharks (pers. comm.). There is no quantifiable evidence showing an effect or no effect. Therefore, it is not known if sharks may be aggregated to the platforms, and if so, if this would mean an actual increase in the number of sharks in the overall area, or just a shift in distribution of the same numbers that already occur. If sharks are drawn to the platform, they will presumably be drawn away from other adjacent areas, thereby reducing the apparent density of sharks (which might result in a decreased risk to the public from sharks). However, no conclusions can be drawn at this time as there are only anecdotal data.*

As this project proposes a substantial increase in total production and number of platforms, more divers will be required to complete regular maintenance. Both the proposed and alternative sites are 3 miles (2.6 nautical miles) from land and potentially less protected from storms and dangerous sea conditions. These factors could increase the number of mortalities within the platforms as well as increase the length of time mortalities remain in the platforms, causing an increase in attraction by sharks and other predators to the platforms.

While this argument remains speculative and will require further study to determine the actual impact, the proposed project would create the opportunity for continual interactions between humans (divers) and sharks. The need to remove sharks is not incidental and in fact may be a necessary part of the success of the operation. To minimize potential impacts the following shark safety plan will be put in place as part of this project.

Shark Safety Plan (Modeled after DAR).

Divers should always be aware that sharks could appear. If a shark is sighted, the list below are procedures to be followed:

- Divers are to notify each other by hand sign (hand held fin-like on top of head) and divers are to aggregate together and face the shark.*
- Divers should try to keep their backs to the platform, buoy, boat or other obstacle.*

- *Divers are not to make any sudden movements, swim away hurriedly, splash, take photographs or flash lights at the shark.*
- *Divers should surface to discuss if the dive should continue as soon as it is safe to do so.*
- *No dive is to continue if any diver feels uncomfortable or would prefer to abort.*
- *No employee is ever expected to enter the water when sharks are around the platforms; any dive undertaken when sharks have been sighted must be at the diver's sole and absolute discretion.*
- *All sharks sighted are to be noted in the dive log. Record number of sharks, identifying features (species, length, distinguishing marks), behavior towards divers, and period of residence around the platforms.*
- *Management must be notified of these encounters.*

There may be occasions when the offshore crew may have to use extra precautions with sharks. These occasions include, but are not limited to; 1) Shark at site is aggressive towards divers and other objects, 2) Shark has taken up residence or has become territorial at the site. At this point, this is defined by viewing the same shark at the site for 2 or more days in succession. All procedures mentioned above still apply. In addition, extra precautions are listed below:

- *Divers/Snorkelers must add an additional diver to the team size (i.e. 3 divers instead of the normal 2).*
- *Divers/Snorkelers must remain within view on surface or underwater.*
- *One of the dive team must carry a shark "poker" (large stick) if the divers remain in close proximity (<20 ft).*
- *If divers are not in close proximity, every diver should have a "poker."*

The diver supervisor on site is responsible for all dive operations so he/she can suspend any dive operations if they believe it is necessary. If anyone shark starts to exhibit behavior that is considered a danger to divers, then the dive supervisor shall suspend all in-water work, secure the site and notify the Offshore Manager or Assistant Manager and the VP, Operations and/or the President. Prior to any further action, management will consult with the local office of Division of Aquatic Resources to determine the next course of action (i.e. baiting, hooking and/or tagging) to discourage the shark from visiting the site.

Additional Conservation Measures

Monitoring and Reporting. Hawaii Oceanic Technology will undertake, at its own cost, to develop a Monitoring Plan (MP) for documenting all interactions between the project and marine mammals, sea turtles, and sharks. This will be prepared in consultation with NOAA

Fisheries. The assistance of marine mammal scientists, HIHWNMS staff, and/or NOAA Fisheries experts will be obtained to design a program that ensures the maximum practical amount of usable information is collected and incorporated into an MP. This would be similar, though less broad in scope, to the current MP undertaken and currently in process by the US Navy, NAVFAC Pacific, for Hawaiian waters, based on recommendations by local marine mammal mitigation experts (Smultea et al. 2007). Mattila and Walters (pers. comm.) also indicated that "detailed measures of abundance or spatial

distribution were not needed, but that basic records of interactions would suffice.” That is, the MP will include a record of any interactions between marine wildlife and the project structures (platforms), such as any close approach of a whale, such as within 30 meters (100 feet) (as regulated by the MMPA). All Hawaii Oceanic Technology staff shall also adhere to federal recommendations or instructions in the unlikely event of any collisions, or ship strikes. The initial response will be to immediately call the NOAA Fisheries Marine Mammal Stranding Hotline (1-888-256-9840). Hawaii Oceanic Technology could work with HIIWNMS officials to train staff in appropriate first-response measures, although liability concerns need to be addressed prior to undertaking this mitigation measure. Hawaii Oceanic Technology recognizes the complexity of these issues, with sanctuary protocols and ESA considerations, but still affirms their willingness to assist sanctuary or NOAA Fisheries in any such manner that is deemed appropriate.

3. ...conflicts with fishermen

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie “Lala” La‘au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko‘a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

As analyzed in the EIS, section 2.5, there will be less than significant impacts from the project on wild fish because of the distance of the proposed site to the nearest reef, opelu ko‘a, and ono trolling lane (2.0 to 2.6 nm), and distance to the bottom fish grounds (one mile), and the depth of water (1,320 feet).

In the section 2.11 on Cultural Resources, this issue is addressed as follows:

Among the interviewees, there was agreement on the location of cultural resources, such as ‘opelu ko‘a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and ‘opelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract ‘opelu, but that it would not have a permanent affect on the ‘opelu fishery. There was agreement that the platforms would probably attract mabi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mabi and ono. (DEIS, p. 2-128)

4. ...concerns about fish feed

The fish feed initially proposed to be used in the operation is pelleted fish feed that will be produced according to our exact specifications. The company is sensitive to the concern about the sustainability of the harvest of some fish used to produce fish meal and fish oil. Because of this, the company will use a feed company which is responsive to our exact specifications and very transparent about their feed ingredients and processing, and will produce our feed to our exacting specifications. At this time, the vendor to supply the fish feed has not been selected. So, the specific components of fish meal, fish oil is currently unknown. The company has no plans to use GMO soy. The company plans to produce the

highest quality ahi, suitable for sashimi. When the NOSB finalizes its organic standards, Hawaii Oceanic Technology plans to follow its requirements for organic aquaculture. As stated in the EIS, Hawaii Oceanic Technology will also seek to identify local alternatives for its fish food and other components such as protein, Omega 3 and Omega 6 fatty acids in order to obtain more of the feed components from local sources. The company has begun discussions with possible suppliers who might eventually have the capability to meet our supply requirements, but has not finalized any contract to source the feed components locally, yet.

5. ...impacts on cultural resources

The Hawaii Oceanic Technology Draft EIS includes a Cultural Impact Assessment that is consistent with the Guidelines for Assessing Cultural Impacts adopted by the Environmental Council, State of Hawaii on November 19, 1997. The Cultural Impact Assessment clearly presents the results of historical literature and map research, as well as interviews and close consultation with native Hawaiian kupuna with a lifelong and ancestral connection to the ocean in the general area of the proposed site, and on the coastal land adjacent to the proposed ocean lease site. Information from the Cultural Impact Assessment on traditional, cultural and religious rights are addressed in detail in the section 2.11 on Cultural Resources in the DEIS.

As described in Sec. 5.1 of the Cultural Impact Assessment, several fishermen were interviewed for information on fishing patterns in the area. The only two opelu fishermen who have used this general coastal ocean area for many decades were interviewed: Eddie "Lala" La'au and Robert Cambra. Both fishermen informed the researcher for the Cultural Impact Assessment that the fishing ko'a for opelu do not exist in the project area. The longtime bottom fishermen, Kwanji Fukuyama and Robert Cambra noted that the bottom fishing area only extends out to a depth of 150-160 fathoms. This is located about one mile from the proposed ocean lease site.

Section 2.11 on Cultural Resources in the EIS states (DEIS p. 2-129): "

Among the interviewees, there was agreement on the location of cultural resources, such as 'ōpelu ko'a, trolling areas, and bottom fishing areas, and the cultural landscape of the coastal lands. There was agreement that the proposed ocean lease site is deeper than the areas used for bottom fishing and 'ōpelu. There was agreement that the area is not specifically targeted for trolling, though it may be used for trolling by boats in transit from near shore fishing areas to offshore trolling areas.

There was agreement that the platforms may attract 'ōpelu, but that it would not have a permanent affect on the 'ōpelu fishery. There was agreement that the platforms would probably attract mahi and ono and other fish. There was agreement that fishermen should be able to fish for these fish around the platforms. Some individuals thought it might have a beneficial impact on fishing, especially trolling, and make it easier for people to fish for mahi and ono.

The analysis of cultural impacts continues on DEIS, p. 2-130, as follows,

As discussed above, to determine how the proposed activity might affect the traditional cultural values and practices associated with the adjacent land area, twelve ahupua'a in the area were researched in the area locally known as Pu'u ulaula (Pabinabina to Kaihooa) and Black Point (Malae Point) (Ki'iokalani, Puaiki and Puanui), including identifying and contacting all the known and identified cultural practitioners and kupuna, local landowners or long-term lessees, the recognized konohiki of the area and the native Hawaiian families culturally attached to the land.

For the interviewees who camped and shore fished along the shoreline adjacent to the proposed site, they were asked to assess the impact of the proposed action, alternatives, and mitigation measures on the cultural resources, practices and beliefs. In the interviews, each of them said it wouldn't affect them at all. They each emphasized that the site was far offshore, in deep water that is not used for any cultural activity, such as fishing, and was not in the path of any cultural activity such as voyaging. They also noted that the distance from shore resulted in the proposed project having no impact on the view shed from the coastal trails and camps. They said there are already boats that regularly traverse the ocean closer to shore, so a few more boats won't make a difference. In other words, the interviewees with cultural associations with the adjacent land all agreed that the addition of the proposed project's work boats and the tops of Oceanspheres, will have no impact on the cultural resources, practices and beliefs of the coastal lands (Richards 2008, Von Holt 2008, Ho'opai 2008, Hanohano 2008).

A primary cultural value that was stated by the Ho'opai 'obana and shared by other interviewees is: "You have to take care of nature and it'll take care of you. You need to give back. The more you give back, the more it'll take care of you." (Ho'opai 2008). Bernard Ho'opai encouraged the aquaculture farm to give back to the environment and community.

Cultural practitioners and kama'āina with multi-generational connections to the land on the adjacent shoreline also noted no positive or negative impact of the proposed action on their activities (Ho'opai 2008, Hanohano 2008, Akau 2008, Von Holt 2008, Richards 2008).

6. ...impacts from the self-powered cages with their OTEC that pulls up seawater from below the cage...how this affects benthic and pelagic organisms

The EIS Chapter 2.4 on Water Quality states in Section 2.4.2 on Environmental Impacts that "Pumping water from a depth of 427 feet (130 meters) to the platform depth of 180 feet (55 meters) will have no effect on nutrient concentrations around the platforms. While the water drawn from 427 feet (130 meters) is just below the SML, the differences in temperature, nutrients, and other water quality parameters between these two water masses is negligible (see table 2.4-1).

Because the intake for the cold water pipe is located at 200m depth, and the bottom is at 400m, there would be no impact from the intake on the benthic environment. Because there is no impact on water quality, there is no expected impact on pelagic organisms.

7. ...overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

The project proposes to grow ahi in a sustainable manner, while protecting the environment, and producing meaningful work for local area residents. Some ahi produced in the aquaculture operation will be sold in the local market. But, the target market for the ahi is the US domestic market, especially the west coast, as well as Japan because of the higher price the product will obtain. These sales made out of Hawaii will generate revenue that will benefit the state in terms of taxable export revenues, the company's employees and investors which are primarily based in Hawaii. Domestic sales to US and Hawaii customers will directly contribute to food security for these US and Hawaii consumers. The company does not want to hurt local fisherman who also catch high value tuna this is sold locally but also exported to Japan and the mainland. Hawaii only consumes 3,000 tons annually of tuna of which 80% is imported. From a sustainability stand point the company would be happy to provide tuna to the local market to reduce imports so long as it does not have a negative impact on local fishermen.

8. HOT essentially is asking the citizens of HI to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs.

As noted in the Section 3.0 on Conformance with Public Plans and Policies Section 3.1 on “Relationship to State Statutes, Plans and Policies” on pp. 3-1 – 3-5, open ocean aquaculture is consistent with state policies. Hawaii has already decided that aquaculture should be pursued, while also meeting the high environmental quality standards required in the State of Hawaii. Hawaii Oceanic Technology is committed to this high environmental standard, as shown in the mitigation measures and monitoring programs it will implement. Hawaii has a 200,000 square mile Exclusive Economic Zone (EEZ), second largest in the United States behind Alaska, that can be enjoyed by commercial fisherman, recreational fisherman, boaters and others. As stated Hawaii law allows open ocean aquaculture which is highly regulated to meet the strictest environmental standards. Our ocean lease request and permit asks for less than one-half square mile or .00025 percent of the available EEZ to pursue a legally allowed commercial endeavor that will provide jobs, contract revenues and tax revenues to the state with an anticipated finding of no significant impact to the environment.

9. It is imperative that HOTI address many issues before a conservation lease is granted. DLNR, Tetrattech and OEQC should "hold HOTI accountable and provide the public with a more informative and thorough EIS."

Hawaii Oceanic Technology has produced a Draft EIS for which the state in its January 30, 2009 acceptance letter found to be in “conformance with Chapter 343, HRS and Chapter 11-200 , HAR and declared that “a finding of no significant impact to the environment is anticipated for the proposed project.” Final EIS which has been revised to provide additional information, and respond to questions from public and agency comments that were provided on the Draft EIS is being submitted.

Your comments on the DEIS were comprehensive. We hope that these responses to each of your questions will be useful for you. Thank you for your involvement in this process.

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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AND COASTAL LANDS

Mr. Spencer, ,

2009 APR 17 A 9:01

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetratech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Sincerely,

Justine Bartow-Funk
786 mahealani
kihei, HI 96753

64319

Chair Laura Theilen
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1151 Punchbowl Street
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2009 APR 14 A 9:21

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Christine Calvo
55-3147 Park Road
Hawi, HI 96719

6420

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Catherine Hirsch
PO Box 755
Anahola, HI 96703

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NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Alex Oshiro
1920 Kahakai Dr.
Honolulu, HI 96814-4820

808-942-4646

6421

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

kimberly wylie
rr 4 box 2356
pahoia, HI 96778

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NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Deborah Smith
3738b Manini way
Honolulu, , HI 96816

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Rowena Vaca
75-5773 Kaila Place
Kailua Kona, HI 96740

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
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2009 MAR 27 P 3: 28

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech Environmental
Quality Control

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetratech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Sincerely,

Traci Bean
900 haunani pl.
wailuku, HI 96793

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,
Elko Evans

Elko Evans
3225 Pakanu St
Honolulu, HI 96822

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

DAVID GIANTOMASI
73-1304 Awakea St.
Kailua-Kona, HI 96740

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

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Sincerely,

Rowena Vaca
75-5773 Kaila Place
Kailua Kona, HI 96740

64149

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Mr. Spencer, ,

2009 MAR 27 A 11: 24

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Aloha,

I've had significant concerns about the existing Kona Blue aquaculture "farm", and now I have even more about Hawaii Oceanic Technology's plan.

The DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource, part of the Public Trust, and a resource upon which all life depends in Hawai'i (and as it flows throughout the world's waters). HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo,

janice palma-glennie
pobox 4849
kailua-kona, HI 96740

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Pauline Mac Neil
112 Haokea Drive
Kailua, HI 96734

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, office of Environmental Quality Control

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Sincerely,

gail McElrath
p.o. box 2017
Pearl City, HI 96782

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Mapuana Peterson
175 Banyan Dr.
Hilo, HI 96720

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Untethered? Have they given much thought to storms at sea? It appears they haven't given much to thought about anything but profit.

Sincerely,

Dave Kisor
45-223 Makahinu St.
611
Kaneohe, HI 96744

951-276-0368

44151

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Mr. Spencer, ,

2009 MAR 27 A 11: 24

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental
Quality Control

DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

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Sincerely,

Sally Yoshida
465 Kapahulu Ave. #5G
Honolulu, HI 96815

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Nina Mnasevitch
4457 Laukini Rd.
Lihue, HI 96766

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

Lawrence Sullivan
4224 Waiālae Ave, 5-408
Honolulu, HI 96816

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Regina Roy
140 Uwapo Rd
#35-201
Kihei, HI 96753

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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WILL THESE FISH BE GENETICALLY ALTERED? I RECENTLY SAW A STUDY THAT THESE FISH WIPE OUT EXISTING POPULATIONS AFTER 40 GENERATIONS IF ONE GETS LOOSE I ALSO THE OTHER FISH DNA CHANGE THROUGH MATING.

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Sincerely,

Marsha Tokareff
45-3474 Kawila St, box 1967
box 1967
Honokaa, HI 96727

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Lori Coleman
1367 L. Kimo Drive
Kula, HI 96790

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

David Balfour
930 S Kihei Rd
Kihei, HI 96753

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

Christina Bishop
69-D Railroad Ave. #62
Hilo , HI 96720

4424

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

mark grandoni
po box 1269
kapaau, HI 96755

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR -7 A 8: 14
DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
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Sincerely,

Jeff Sacher
PO Box 44910
Kamuela, HI 96743

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

Diane Kanealii
61-4011 Kailapa St.
Kawaihae, HI 96743

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Sincerely,

Michael Wallman
5114 Montgomery Road
Ellicott City, MD 21043

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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sincerely,

HAL PHILLIPS
P.O.BOX 4464
North Hollywood, CA 91617

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Leilani Resureccipn
P.O. Box 1077
Naalehu, HI 96772

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

I have SIGNIFICANT concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

VA HALL

virginia hall
77-361 ailina st.
kailua-kona, HI 96740

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR -7 A 8:14
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

4424

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

B.A. McClintock
Disabled-email only
Honolulu, HI 96825

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -7 A 8:14

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Fern Holland
4664B Apopo Rd
Kapa'a, HI 96746

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Marti Townsend
Aiea
Aiea, HI 96701

808-524-8220

64240

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Susan Fladager
47 Nohokai St
Kihei, HI 96753

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -7 A 8:14

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, potential impacts with changes in wild fish patterns in the area, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms through circulated wastes; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Penny Levin
224 Ainalou Place
Wailuku, HI 96793

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Lois Cheesman
241 Temelec Circle
Sonoma, CA 95476

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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sincerely,

Jennifer Bennett
2226 Myrtle St Apt B
Erie, PA 16502

44260

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Andrea Brower
POBox 220
Anahola, HI 96703

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS
2009 APR - 8 A 10: 06
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

ane & marc takaha
3378 Keha dr
Kihei, HI 96753

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

Please read the following message which expresses my views on the DEIS submitted by Hawaii Oceanic Technology:

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Mary P. Daoust
190 Hauoli St #305
Wailuku, HI 96793

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Ted Cheeseman
20800 Kittridge Rd
Saratoga, CA 95070

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Brad Parsons
P.O. Box 223374
Princeville, HI 96722

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Jim Kastner
45-222 Lilipuna Road
Kaneohe, HI 96744

44250

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Stephanie Haddad
PO Box 1211
Haiku, HI 96708

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -8 A 10:06

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

44272

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

We would also like to see the following questions addressed in depth:

- * How much waste will be created and how will it affect the marine environment?
- * Can the cages withstand major storms, and what happens if one wanders away from the farm site, since the cages are not tied down and are only one mile from a humpback whale sanctuary?
- * The cages use a new technology to generate their own energy to remain in one place by sucking up sea water from below ? how will this affect benthic and pelagic organisms?
- * Caged fish often attract predators, like sharks; how will an increase in sharks ? traditionally revered Hawaiian animals ? near the farm, be handled (some farms have simply killed them!)?

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Sincerely,

Jessica Niles
300 Ma'alaea Rd., Ste. 211
Wailuku, HI 96753

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -8 A 10: 05

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

64202

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Sincerely,

Brooke Porter
300 Maalaea Road
Suite 211
Wailuku, HI 96793

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS
2009 APR - 8 A 10: 05
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

4/2/09

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

michael swerdlow
pob 384192
waikoloa, HI 96738

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -8 A 10: 05

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Rowena Vaca
75-5773 Kaila Place
Kailua Kona, HI 96740

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Frances Rieha
PO Box 1089
Kapaau, HI 96755

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

Mr. Spencer, ,

2009 APR 14 A 9: 20

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental
Quality Control

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

The DEIS that HOTI submitted doesn't adequately cover a variety of obvious concerns, like: How much waste will be created and how will it affect the marine environment? Can the cages withstand major storms and what happens if one wanders away from the farm site, since the cages are not tied down and are only one mile from a humpback whale sanctuary? The cages use a new technology to generate their own energy to remain in one place by sucking up sea water from below - how will this affect benthic and pelagic organisms? What cultural impacts will it have?

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Mary Sky Schoolcraft
PO Box 1358
Kapa'au, HI 96755

Adaline F
Cummings/DLNR/StateHiUS
04/14/2009 10:48 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/14/2009 10:47 AM -----



jonathan hutchinson
<jhutchin@hawaii.edu>

04/14/2009 10:44 AM

Please respond to
jhutchin@hawaii.edu

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

jonathan hutchinson
2280 kilauea ave
hilo, HI 96720

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:46 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:45 AM -----



normand dufresne
<normandgorby@aol.com>

04/07/2009 04:40 PM

Please respond to
normandgorby@aol.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

normand dufresne
p.o. box 587
pahoa, HI 96778

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:52 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:51 AM -----



Richard Powers
<konaskye@yahoo.com>

04/08/2009 10:53 AM

Please respond to
konaskye@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Richard Powers
P.O. Box244
Naalehu, HI 96772

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:59 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc

Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:58 AM -----



Kathy-Lyn Allen
<naiaomanoa@yahoo.com>

04/11/2009 09:34 AM

Please respond to
naiaomanoa@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Kathy-Lyn Allen
2702 High Street
Pueblo, CO 81003

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:59 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:58 AM -----



Marge White
<marge.us.white@gmail.com>

To Adaline.F.Cummings@hawaii.gov
cc

04/11/2009 08:32 AM

Please respond to
marge.us.white@gmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Marge White
P.O. Box 2990
Kamuela, HI 96743

**Adaline F
Cummings/DLNR/StateHiUS**
04/13/2009 10:58 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:57 AM -----



Brenda Kwon
<brenda.kwon@gmail.com>

04/09/2009 04:14 PM

Please respond to
brenda.kwon@gmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Brenda Kwon
874 Dillingham Blvd.
Honolulu, ID 96817

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:56 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:56 AM -----



Mark Alapaki Luke
<markluke@hawaii.edu>

04/09/2009 12:06 PM

Please respond to
markluke@hawaii.edu

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Mark Alapaki Luke
P.O. Box 11085
103A Honolulu HI 96828

**Adaline F
Cummings/DLNR/StateHiUS**

04/13/2009 10:59 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS

cc

bcc

Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:58 AM -----

Faith M. Willcox

04/12/2009 04:28 PM

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496



Aloha!

My concerns are significant about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Faith M. Willcox

Westport, ME

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:59 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:58 AM -----



Carmen L
<clonline@gmail.com>

04/13/2009 07:13 AM

Please respond to
clonline@gmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Carmen L
Madrid
Madrid, ot 00000

Adaline F
Cummings/DLNR/StateHiUS
04/13/2009 10:59 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/13/2009 10:58 AM -----



Carmen L
<clonline@gmail.com>

04/13/2009 07:13 AM

Please respond to
clonline@gmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Carmen L
Madrid
Madrid, ot 00000

64293

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Florence Bahr
2728 Kauhale St
Kihei, HI 96753

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AND COASTAL LANDS
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NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

Especially since there have already been problems with the smaller, supposedly less impacting fish farming operations already in Hawai'i (and, in particular, on the Kona coast), I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

janice palma-glennie
pobox 4849
kailua-kona, HI 96740

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AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Bruella Berard
77-6379 Kenika Place
Kailua Kona, HI 96740

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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

john carty
2580 kekaa dr.
#115-157
lahaina, HI 96761

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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
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Sincerely,

Mary Ann Hynes
RR1
Prole, IA 50229

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AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

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Sincerely,

barak kanealii
94-366 Makapipipi St
Mililani, HI 96789

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NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
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Mr. Spencer, ,

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Please give more careful consideration to this issue. As it stands, it would be using our waters for an experiment, with many issues related to pollution, health issues and the safety of marine mammals, inadequately addressed.
Mahalo nui loa.

Sincerely,

Sherrie Moore
RR 3 Box 1302
Pahoa, HI 96778

808 966 9968

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& COASTAL LANDS
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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
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Sincerely,

michael grammer
493 pio dr
wailuku, HI 96793

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OFFICE OF CONSERVATION
AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Tui Anderson
1077 Ulu Kanu St.
Wailuku, HI 96793

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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Andrea Brower
POBox 220
Anahola, HI 96703

DEPT OF LAND &
NATURAL RESOURCES
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OFFICE OF CONSERVATION
AND COASTAL LANDS

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Henry Chee
73-1328 Awakea St.
Kailua-Kona, HI 96740

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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Henry Chee
73-1328 Awakea St.
Kailua-Kona, HI 96740

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Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

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Sincerely,

Tamar Hodel
2024 Citron St. # 401
Honolulu, HI 96826

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STATE OF HAWAII

44298

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Mary Meshell
116 Buchanan Ave
Nettleton, MS 38858-6061

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NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

Please don't give away yet another one of our natural resources to a business that will be sending it's product and it's profits out of Hawaii and potentially damage our environment. This has to stop! Please. This should be a shared resource.

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Lynn Flaming
PMB 185
PO Box 791540
Paia, HI 96779

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NATURAL RESOURCES
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442

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I'm concerned that HOTI's proposed fish farms has not been tested to see what kind of harm their cages will bring ocean organisms, as well as to fisherpeople.

They need to start small, if at all, to watch their effects on whales, and other marine mammals as well as the entire ocean, before being allowed to build what they want. Too much is at risk for the public resource of Hawaiian waters. More information is needed via a thorough EIS.

Sincerely,

Marjorie Erway
PO Box 2807
Kailua Kona, HI 96745

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STATE OF HAWAII

44295

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

The draft EIS ignores a key question: how many calories it takes to produce a calorie of farmed fish including air transport, if required. If it is in the range of 20 to 80 calories then it is no better than farm animals and not worth the risk to the environment. It would have to be around 1 to 3 calories to compete with gains and have a chance of positively impacting the world food basket with a minimum impact on global warming.

If it takes much more than 20 calories to produce a calorie of fish, the fish farm will be business failure and an unaffordable drain on the environment.

Sincerely,

Duane Erway
P.O. Box 2807
Kailua-Kona, HI 96745

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STATE OF HAWAII

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64294

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Cindy Granholm
3617 Keoniana
Princeville, HI 96722

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OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR -9 P 4: 23
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Sincerely,

catherine usiskin
2 ormonde terrace
london, ot nw87lp

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR - 9 P 4: 24
DEPT OF LAND &
NATURAL RESOURCES
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Sincerely,

Catherine Hirsch
PO Box 755
Anahola, HI 96703

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OFFICE OF CONSERVATION
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Sincerely,

Arnold Kotler
PO Box 790445
Paia, HI 96779

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OFFICE OF CONSERVATION
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2009 APR -9 P 4: 24
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Sincerely,

Virginia Bennett
1201 Wilder Ave
Honolulu, HI 96822

808-956-4165

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AND COASTAL LANDS
2009 APR -9 P 4: 24
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STATE OF HAWAII

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Sincerely,

DAVID GIANTOMASI
73-1304 Awakea St.
Kailua-Kona, HI 96740

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2009 APR - 9 P 4: 25
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Chair Laura Theilen
Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
Honolulu, HI 96813
US

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Sincerely,

Richard Owen
248 Pakalana PL
Kihei, HI 96753

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -9 P 4: 24

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

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Office of Conservation and Coastal Lands, DLNR
1151 Punchbowl Street
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We should not exploit our oceans instead we need to learn to properly take better care of our ocean & planet. Land based companies pollute our oceans with wastes & burning fossil fuels causes more ocean acidification. Mercury poisons end up in our fishes because of our exploitation of our planet. we need to take better care of our planet & be more responsible for the consequences that are cause by our actions. Do not lease our oceans for exploitation.

Sincerely,

Alex Oshiro
1920 Kahakai Dr.
Honolulu, HI 96814-4820

808-942-4646

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -9 P 4: 24

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OFFICE OF CONSERVATION
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Sincerely,

Tara Emmerson
8 Adrian Ave
Vermont South, Australia, ot 3133

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -9 P 4: 24

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OFFICE OF CONSERVATION
AND COASTAL LANDS

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I urge the Dept. of Land and Natural Resources (DLNR) to immediately consult with the Aha Kiole Advisory Committee (AKAC) on this issue. AKAC is attached to DLNR through Act 212, yet we have received no information from them on this project.

I also urge DLNR, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable, provide the public with a more informative and thorough EIS, include a detailed CIS with information from Kohala native Hawaiian practitioners including traditional fishermen, and to hold public meetings and consultation meetings with the Kohala traditional Hawaiian communities.

Sincerely,
Hugh Lovell, Hawaii Island Kiole
Aha Kiole Advisory Committee

Hugh Lovell, Kiole, Hawaii Island
64-5212 Kipahele Street
Kamuela, HI 96743

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

2009 APR -9 P 4: 24

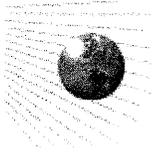
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AND COASTAL LANDS

**Adaline F
Cummings/DLNR/StateHiUS**
04/06/2009 09:25 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



**Sam J
Lemmo/DLNR/StateHiUS**
04/06/2009 09:18 AM

To Adaline F Cummings/DLNR/StateHiUS@StateHiUS
cc Dan A Polhemus/DLNR/StateHiUS@StateHiUS, Morris M
Atta/DLNR/StateHiUS@StateHiUS
Subject Re: Fw: Please Answer Our Questions on the DEIS for the
Ahi Aquaculture Project Ref # HA-3496

Adaline, go ahead and forward to Dawn Hegger. |

Samuel J. Lemmo, Administrator ><))))>
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813
Phn (808) 587-0377
Fax (808) 587-0322
www.hawaii.gov/dlnr/occl

Adaline F Cummings/DLNR/StateHiUS

**Adaline F
Cummings/DLNR/StateHiUS**
04/06/2009 08:33 AM

To Sam J Lemmo/DLNR/StateHiUS@StateHiUS, Dan A
Polhemus/DLNR/StateHiUS@StateHiUS, Morris M
Atta/DLNR/StateHiUS@StateHiUS
cc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Good morning!

I received about 50-100 testimony about this which is clogging up my e-mail. Can I forward all this to one of you?

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 08:29 AM -----



Brad Parsons
<kauaibrad@hotmail.com>

04/04/2009 05:36 PM

Please respond to
kauaibrad@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Brad Parsons
P.O. Box 223374
Princeville, HI 96722

Adaline F
Cummings/DLNR/StateHiUS

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS

cc

04/06/2009 09:27 AM

bcc

Subject Aquaculture questions

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Brad Parsons
<kauaibrad@hotmail.com>

To Adaline.F.Cummings@hawaii.gov

04/04/2009 05:36 PM

cc

Please respond to
kauaibrad@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Brad Parsons
P.O. Box 223374
Princeville, HI 96722

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Alea Schechter
<alealani@hawaii.rr.com>

04/04/2009 05:37 PM

Please respond to
alealani@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Alea Schechter
1777 Ala Moana Blvd. #813
Honolulu, HI 96815

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Tristen Wanke
<bluu1@yahoo.com>

04/04/2009 05:38 PM

Please respond to
bluu1@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Tristen Wanke
P.O. Box # 2
makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Robert Wagner
<rtwagner@bellsouth.net>

04/04/2009 05:53 PM

Please respond to
rtwagner@bellsouth.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Robert Wagner
3100 Sweetwater Rd
Apt. 3112
Lawrenceville, GA 30044

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



jamie gilmore
<jamie_gilmore@yahoo.com>

04/04/2009 06:10 PM

Please respond to
jamie_gilmore@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

jamie gilmore

po box 986
naalehu, HI 96772

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



"B.A. McClintock"
<redahi@hawaii.rr.com>

04/04/2009 06:17 PM

Please respond to
redahi@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

B.A. McClintock
Disabled-email only
Honolulu, HI 96825

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Denise Lytle
<squishytart@moose-mail.com>

04/04/2009 06:23 PM

Please respond to
squishytart@moose-mail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Denise Lytle
73 Poplar St.
Fords, NJ 08863

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



becky robison
<beckyr12p@gmail.com>

04/04/2009 06:27 PM

Please respond to
beckyr12p@gmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

becky robison
1049 uluopihi loop
kailua, HI 96734

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Kevin Brown
<kboom@wave.hicv.net>

04/04/2009 06:30 PM

Please respond to
kboom@wave.hicv.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kevin Brown
HC1 Box 628
Kaunakakai, HI 96748

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



suzanne garrett
<feetogo2@yahoo.com>

04/04/2009 06:39 PM

Please respond to
feetogo2@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

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Aquaculture Project Ref # HA-3496

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Mahalo for your time.

suzanne garrett
2023 lime st. #J
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Bill Akiona
<hoa.aina@yahoo.com>

04/04/2009 06:47 PM

Please respond to
hoa.aina@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Bill Akiona
P.O. Box 404
Waianae, HI 96792

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



"Capt. Paul Clark"
<sos@saveourseas.org>

04/04/2009 06:53 PM

Please respond to
sos@saveourseas.org

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Capt. Paul Clark
PO Box 813
Hanalei, HI 96714

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



gia baiocchi
<alohagia@mac.com>

04/04/2009 06:55 PM

Please respond to
alohagia@mac.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

gia baiocchi
po box 30899
Anahola, HI 96703

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Frederika Ebel
<lapuma7@hotmail.com>

04/04/2009 07:02 PM

Please respond to
lapuma7@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Frederika Ebel
PO Box 701
Flemington, NJ 08822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Randy Tashjian
<envirohero@hotmail.com>

04/04/2009 07:02 PM

Please respond to
envirohero@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Randy Tashjian
1031 Trafalger Drive
Glendale, CA 91207

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Nina Monasevitch
<oceanmana@hawaiiintel.net

To Adaline.F.Cummings@hawaii.gov

>

cc

04/04/2009 07:03 PM

Please respond to
oceanmana@hawaiiintel.net

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Nina Monasevitch
4457 Laukini Rd.
Lihue, HI 96766

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Odette Rickert
<odette@numerologyreadings.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 07:39 PM

Please respond to
odette@numerologyreadings.com

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Odette Rickert
PO Box 12
PO Box 12
Hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Catherine Okimoto
<phoenixr3@yahoo.com>

04/04/2009 07:51 PM

Please respond to
phoenixr3@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Catherine Okimoto
RR4 Box 2251
14-869 Hapu'u Rd.
Pahoa, HI 96778

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



noel al-khatib
<teachsped63@msn.com>

04/04/2009 07:51 PM

Please respond to
teachsped63@msn.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi



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Mahalo for your time.

noel al-khatib
po box 343
hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Michael Howden
<michael@permaculturemaui.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 08:44 PM

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Please respond to
michael@permaculturemaui.com

Aloha!

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Mahalo for your time.

Michael Howden
2020 Olinda RD
Makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



robert mceldowney
<robertdavid@warmlava.com
>

To Adaline.F.Cummings@hawaii.gov
cc

04/04/2009 08:47 PM

Please respond to
robertdavid@warmlava.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

robert mceldowney
po box 450
laupahoehoe, HI 96764

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



elizabeth kane
<ekane@hawaii.edu>

04/04/2009 09:09 PM

Please respond to
ekane@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

elizabeth kane
2333 Kapiolani Blvd.
unit 312
honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Lehua Kaulukukui
<kananilehua@hawaii.rr.com>

To Adaline.F.Cummings@hawaii.gov



04/04/2009 09:13 PM

Please respond to
kananilehua@hawaii.rr.com

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.
Lehua Kaulukukui

Lehua Kaulukukui
68-1756 Puwalu St.
68-1756 Puwalu St. Waikoloa, HI 96738
Waikoloa, HI 96738

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



"Toni A. Wolfson ,RN"
<hummingdeer@yahoo.com>

To Adaline.F.Cummings@hawaii.gov

04/04/2009 09:24 PM

cc

Please respond to
hummingdeer@yahoo.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

Toni A. Wolfson, RN
hummingdeer@yahoo.com
Felton, CA 95018

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Shawn White
<kaleimakamae@hotmail.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 09:46 PM

Please respond to
kaleimakamae@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Shawn White
PO Box 2502
Honolulu, HI 96804

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Fern Holland
<fernnygirl@yahoo.com>

04/04/2009 10:24 PM

Please respond to
fernnygirl@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Fern Holland
4664B Apopo Rd
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Pamela Polland
<peemer@kula.com>

04/04/2009 10:30 PM

Please respond to
peemer@kula.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Pamela Polland
226 Kulalani Drive
Kula, HI 96790

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Bobbi Lempert
<earthchild4ever@yahoo.com>

04/05/2009 10:12 AM

Please respond to
earthchild4ever@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Bobbi Lempert
PO Box 791881
Paia, HI 96779

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Leslie Yee Hoy
<lesyeehoy@yahoo.com>

04/05/2009 10:17 AM

Please respond to
lesyeehoy@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Leslie Yee Hoy
1305 Hele
Kailua, HI 96734

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Ron Dixon
<xidnor@yahoo.com>
04/05/2009 11:27 AM

Please respond to
xidnor@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Ron Dixon
po box 223403
Princeville, HI 96722

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Gregg Haines
<gshaines@earthlink.net>

04/05/2009 12:33 PM

Please respond to
gshaines@earthlink.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Questions on Ahi Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast.

While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on:

- Wild fish populations.
- Conflicts with marine mammals, endangered species and fishermen.
- Concerns about fish feed.
- Impacts on cultural resources.
- Impacts from the self-powered cages with their ocean thermal energy exchange, and how it may affect benthic and pelagic organisms.

Hawaiian waters are a public resource. HOTI is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted.

I urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

Gregg Haines
2955 Kailiili Rd.
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



daniel greider
<buddha_stalin@verizon.net>

04/05/2009 01:33 PM

Please respond to
buddha_stalin@verizon.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

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Mahalo for your time.

daniel greider
1747 billview dr
lanaster, PA 17601

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Tim Brause
<tbrause@yahoo.com>

04/05/2009 01:54 PM

Please respond to
tbrause@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Tim Brause
350 Ward Ave.
Suite 106-92
Honolulu, HI 96814

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Den Mark Wichar
<deedub@webtv.net>

04/05/2009 02:29 PM

Please respond to
deedub@webtv.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Answers Needed Re: DEIS for Ahi Aquaculture Project Ref # HA-3496

Aloha!

There are significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. submitted regarding its ahi aquaculture project off Kohala Coast. While proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address effects of proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are PUBLIC resource. HOTI essentially is asking citizens of Hawaii to lease land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have existing natural resources will be shared by all of us, while profits will be only theirs.

No fairness there!

It is imperative that HOTI address many issues before conservation lease is granted. I also urge Department of Land and Natural Resources, Tetrattech and Office of Environmental Quality Control to hold HOTI accountable and provide public with more informative and thorough EIS.

Mahalo.

Den Mark Wichar
711 W 25 St
Vancouver, WA 98660

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Mary Spadaro
<mlspadaro@yahoo.com>

04/05/2009 03:11 PM

Please respond to
mlspadaro@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Mary Spadaro
980 Prospect St. #2
Honolulu, HI 96822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Mary Spadaro
<mlspadaro@yahoo.com>

04/05/2009 03:12 PM

Please respond to
mlspadaro@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Mary Spadaro
980 Prospect St. #2
Honolulu, HI 96822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Tara Cornelisse
<tara.cornelisse@gmail.com>

04/05/2009 03:25 PM

Please respond to
tara.cornelisse@gmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Tara Cornelisse
2071 huckleberry rd.
San Rafael, CA 94903

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Keoki Baclayon
<baclayon@hawaii.edu>

04/05/2009 04:12 PM

Please respond to
baclayon@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Keoki Baclayon
91-1209 Kaneana St J-7
Ewa Beach, HI 96706

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



chris kobayashi
<waioli2@hawaiiantel.net>

04/05/2009 04:29 PM

Please respond to
waioli2@hawaiiantel.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

What kind of feed will they feed the fish? GMO feed?
Which have never been proven to be safe for animals and humans to eat. Let
alone, exposing that to our ocean waters.

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Mahalo for your time.

chris kobayashi
pob
hanalei, HI 96714

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Deanna Chang
<changdidi@hotmail.com>

04/05/2009 04:41 PM

To Adaline.F.Cummings@hawaii.gov

cc



Please respond to
changdidi@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Deanna Chang
4223 Kaimanahila St.
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Michael Maddux
<maddux@aloha.net>

04/05/2009 04:53 PM

Please respond to
maddux@aloha.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Michael Maddux
PO Box 1596
P.O. Box 1496
Kapaau, HI 96755-1496

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Amara Karuna
<amara@mindspring.com>

04/05/2009 05:20 PM

Please respond to
amara@mindspring.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Amara Karuna
PO box 1430
Pahoa, HI 96778

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Sara Bartlett-Valente
<kulanalu@yahoo.com>

04/05/2009 05:56 PM

Please respond to
kulanalu@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Sara Bartlett-Valente
59-618 Akanoho Pl.
Haleiwa, HI 96712

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----





Kuuleilani Reyes
<kuufantagi@hotmail.com>

04/05/2009 06:01 PM

Please respond to
kuufantagi@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kuuleilani Reyes
3385 Likini Street
Honolulu, HI 96818

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Katherine Ross
<kcross@hawaii.rr.com>

04/05/2009 06:18 PM

Please respond to
kcross@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Katherine Ross
PO Box 603
Papaikou, HI 96781

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Ken Ng <caide65@aol.com>

04/05/2009 06:54 PM

Please respond to
caide65@aol.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Ken Ng
3557 Butler Ave,
LA, CA 90066

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Kaitlyn McKee
<silversurferkauai@hotmail.com>
m>

To Adaline.F.Cummings@hawaii.gov

cc

04/05/2009 07:43 PM

Please respond to
silversurferkauai@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Kaitlyn McKee
P.O. Box 2196
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Leona Toler
<Kealanohea@yahoo.com>

04/05/2009 08:35 PM

Please respond to
Kealanohea@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Leona Toler
195 Todd Avenue
Hilo, HI 96720-4850

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Eve Powers
<sacredearth@hawaii.rr.com>

04/05/2009 09:15 PM

Please respond to
sacredearth@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time. Eve Powers, Kapaa, HI

Eve Powers
1262 Crossley Rd.
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



madeleine migenes
<madmig@hotmail.com>

04/05/2009 10:34 PM

Please respond to
madmig@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

madeleine migenes
2590 Alohia Street
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



madeleine migenes
<madmig@hotmail.com>

04/05/2009 10:34 PM

Please respond to
madmig@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

madeleine migenes
2590 Alohia Street
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Kalani Kalima
<kalanzo@hotmail.com>

04/06/2009 12:26 AM

Please respond to
kalanzo@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kalani Kalima
810 N. Vineyard
810 N. Vineyard
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Kalani Kalima
<kalanzo@hotmail.com>

04/06/2009 12:26 AM

Please respond to
kalanzo@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

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Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kalani Kalima
810 N. Vineyard
810 N. Vineyard
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



James Lopez

04/06/2009 02:52 AM

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

James Lopez

Topeka, KS

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Mary Beth Murrill
<marybethmurrill@yahoo.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/06/2009 04:33 AM

Please respond to
marybethmurrill@yahoo.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

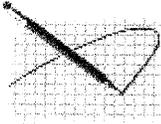
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Mahalo for your time.

Mary Beth Murrill
Altadena, CA 91001

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Carolyn Moore
04/06/2009 04:41 AM

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Carolyn Moore

Mesa, AZ 85215

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Ravi Grover
<avatar11@rediffmail.com>
04/06/2009 06:54 AM

Please respond to
avatar11@rediffmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject re: DEIS for the Ahi Aquaculture Project Ref # HA-3496

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Ravi Grover
POB 802103
Chicago, IL 60680

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Lisa Galloway
<lisa.m.galloway@gmail.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/06/2009 06:55 AM

Please respond to
lisa.m.galloway@gmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I write about the DEIS to farm ahi off the Big Island coast. I know that salmon farming is not done correctly and results in parasites and diseases affecting wild fish, and fish farm pollution adversely affecting the aquatic environment. As fish farming can be done sustainably and respectfully, it is important that it be set up on a small scale first, monitored carefully and that mistakes made be the responsibility of those who intend to profit. It is important that the public is informed and heard about such new industries in our backyard, our ocean.

Like KAHEA, I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Lisa Galloway
Nahaku Place
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



pete sayer
<epyachts@aol.com>

04/06/2009 07:38 AM

Please respond to
epyachts@aol.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

pete sayer
pobox767
makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Garid Faria



<garid@hawaii.edu>

04/06/2009 08:53 AM

Please respond to
garid@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Garid Faria
2605 La'au St.#101
2605 La'au St., Apt 101
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Angel Prince
<amprince2000@yahoo.com>

04/06/2009 09:00 AM

Please respond to
amprince2000@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Angel Prince
PO Box 1991
Honokaa, HI 96727

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Dean Otsuki
<dolive2surf@yahoo.com>

04/06/2009 09:06 AM

Please respond to
dolive2surf@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Dean Otsuki
p.o. box 25284
Honolulu, HI 96825

Adaline F
Cummings/DLNR/StateHiUS
04/07/2009 01:17 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 01:16 PM -----



Michal Stover
<mfsleh@yahoo.com>

04/07/2009 01:03 PM

Please respond to
mfsleh@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Michal Stover
3300 Kalihiwai Rd
Kilauea, HI 96754

Adaline F
Cummings/DLNR/StateHIUS
04/07/2009 10:35 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHIUS on 04/07/2009 10:34 AM -----



Satya Anubhuti
<Satya@Citizen-Kane.net>

04/07/2009 09:19 AM

Please respond to
Satya@Citizen-Kane.net

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Satya Anubhuti
PO Box 1010
Pahoa, HI 96778

Adaline F
Cummings/DLNR/StateHiUS
04/07/2009 10:34 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc

Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:34 AM -----



Pamela Day
<tarodream@msn.com>

04/07/2009 08:23 AM

Please respond to
tarodream@msn.com

To Adaline.F.Cummings@hawaii.gov
cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Pamela Day
P.O. Box 551796
Kapaau, HI 96755

Adaline F
Cummings/DLNR/StateHIUS
04/07/2009 10:34 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:33 AM -----



Michele McKay
<mmckay@hula.net>

04/06/2009 09:17 PM

Please respond to
mmckay@hula.net

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Michele McKay
PO Box 11794
Honolulu, HI 96828

Adaline F
Cummings/DLNR/StateHIUS

04/07/2009 10:34 AM

To Dawn T Hegger/DLNR/StateHIUS@StateHIUS

cc

bcc

Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHIUS on 04/07/2009 10:33 AM -----



Sara McCay
<mcnoone@hawaiiantel.net>

04/06/2009 09:05 PM

Please respond to
mcnoone@hawaiiantel.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Sara McCay
62-2219 Ouli Street
Kamuela, HI 96743

Adaline F
Cummings/DLNR/StateHiUS
04/07/2009 10:33 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:32 AM -----



Amanda Rieux
<iamrieux@speakeasy.net>

04/06/2009 06:29 PM

Please respond to
iamrieux@speakeasy.net

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Amanda Rieux
PO Box 775
Kamuela, HI 96743

Adaline F
Cummings/DLNR/StateHiUS
04/07/2009 10:33 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:32 AM -----



Kapua Keliikoa-Kamai
<dkapua@hawaii.rr.com>

04/06/2009 04:29 PM

Please respond to
dkapua@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kapua Keliikoa-Kamai
85-1330 Koolina Street
Waianae, HI 96792

Adaline F
Cummings/DLNR/StateHIUS

04/07/2009 10:31 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS

cc

bcc

Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:30 AM -----



Cindy Lance
<cindyl-hularecords@hawaii.rr
.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/06/2009 03:29 PM

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Please respond to
cindyl-hularecords@hawaii.rr.c
om

Aloha!

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Mahalo for your time.

Cindy A. Lance / 2711 Anuenue Street, Honolulu HI 96822
Cindy Lance

Adaline F
Cummings/DLNR/StateHiUS
04/07/2009 10:23 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/07/2009 10:22 AM -----



Ingrid Tillman
<moolani@hotmail.com>

04/06/2009 01:25 PM

Please respond to
moolani@hotmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Ingrid Tillman
HCR2 Box 6954
HCR2 Box 6954

Keau, HI 96749

Adaline F
Cummings/DLNR/StateHIUS
04/06/2009 12:41 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:40 PM -----



Charles Lawson
<Lawsoncyn@aol.com>

04/06/2009 12:40 PM

Please respond to
Lawsoncyn@aol.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Charles Lawson
27400 132nd ave se #F302
Kent, WA 98042

Adaline F
Cummings/DLNR/StateHIUS
04/06/2009 12:34 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:33 PM -----



nancy ravelo
<kynolive@yahoo.com>

04/06/2009 12:33 PM

Please respond to
kynolive@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetratex and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

nancy ravelo
2190 analu place

~~10~~ Kaunapuu HI 96757

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:28 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:27 PM -----



Corey Ann Lewin
<koliana8@yahoo.com>

04/05/2009 10:03 AM

Please respond to
koliana8@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Corey Ann Lewin
923 N. San Vicente Blvd #7
West Hollywood, CA 90069

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:28 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:27 PM -----



christina Gauen
<simone5501@hotmail.com>
04/05/2009 09:48 AM

Please respond to
simone5501@hotmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

christina Gauen
558-A Maluniu Ave.
kailua, HI 96734

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:28 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:27 PM -----



Katy Fogg
<SKMFogg@netscape.net>

04/05/2009 08:58 AM

Please respond to
SKMFogg@netscape.net

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I am fortunate to have visited the Big Island several times, and I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Katy Fogg
3737 Central Street SE /olympia, WA 98501

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:27 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:27 PM -----



Ina Roessler
<us@kauaigems.com>
04/05/2009 08:30 AM

Please respond to
us@kauaigems.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Ina Roessler
4184 kekuanaoa
princeville, HI 96722

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:27 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:26 PM -----



Diana Bethel
<diana4578@gmail.com>

04/05/2009 08:14 AM

Please respond to
diana4578@gmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Diana Bethel
1441 Victoria St.
Honolulu, HI 96822

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:27 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:26 PM -----



Shay Chan Hodges
<shaychan@hawaii.rr.com>

04/05/2009 07:59 AM

Please respond to
shaychan@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Shay Chan Hodges
37 Puu Koa Place
Haiku, HI 96708

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:27 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:26 PM -----



Emily Yeh
<emily.yeh@alumni.usc.edu>
04/05/2009 07:40 AM

Please respond to
emily.yeh@alumni.usc.edu

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Emily Yeh
1821 Kumakani Place
Honolulu, HI 96821

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:26 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:26 PM -----



Denise Snyder
<scott101@hawaii.rr.com>

04/05/2009 06:36 AM

Please respond to
scott101@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Denise Snyder
4952 Mana Place
Honolulu, HI 96816

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:26 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer the Public's Questions on the DEIS for
the Ahi Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:25 PM -----



Paul Moss
<paul@themailpath.com>
04/05/2009 04:12 AM

Please respond to
paul@themailpath.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer the Public's Questions on the DEIS for the
Ahi Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Paul Moss
1849 Whitaker St.
White Bear Lake, MN 55110

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:26 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:25 PM -----



Gwen Ilaban
<gfilaban@aol.com>

04/05/2009 01:45 AM

Please respond to
gfilaban@aol.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc (HOTI). has submitted regarding its ahi aquaculture project off the Kohala Coast.

While the proposed lease site is three times the size of any existing ocean fish farming operation in Hawaii; they claim to produce forty-eight times more fish than another local farm it claims to be similar to.

HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

*Gwen Ilaban
76-6182 Alii Drive
Kailua Kona HI 96740*

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:26 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:24 PM -----



Robert Frutos
<rfphoto@jps.net>

04/04/2009 11:18 PM

Please respond to
rfphoto@jps.net

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Robert Frutos
po box 1214
Volcano, HI 96785

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:25 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:24 PM -----



Sylvia Partridge
<sylpartridge@yahoo.com>
04/04/2009 11:18 PM

Please respond to
sylpartridge@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I do not want the ocean to be cluttered with huge commercial areas and have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Sylvia Partridge
P. O. Box 1255

Hanalei HI 96714

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:25 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:24 PM -----



Kelley Uyeoka
<kuyeoka@hawaii.edu>

04/04/2009 10:56 PM

Please respond to
kuyeoka@hawaii.edu

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Kelley Uyeoka
183-1 Oko St.
Kailua, HI 96734

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:25 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:24 PM -----



Diane Fell <difell@ksbe.edu>

04/04/2009 10:37 PM

Please respond to
difell@ksbe.edu

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Diane Fell
235 auoli dr
Makawao, HI 96768

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 12:11 PM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 12:10 PM -----



Paulette Ka'ano'hi Kaleikini
<paulette.kaleikini@heco.com>
>

04/06/2009 12:09 PM

Please respond to
paulette.kaleikini@heco.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Paulette Ka'ano'hi Kaleikini
89-107 Nanaikala St.
89-107 Nanaikala St.

Wai'anae HI 96792

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 11:28 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 11:27 AM -----



leilea satori
<leilea@lalasun.com>

04/06/2009 11:14 AM

Please respond to
leilea@lalasun.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

leilea satori
po box 1200
honoka'a, HI 96727

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 11:28 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 11:27 AM -----



Meghan Au
<mallihauzer@yahoo.com>

04/06/2009 10:57 AM

Please respond to
mallihauzer@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Meghan Au
41-582 Inoa'ole St.
Waimanalo, HI 96795

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 11:28 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 11:27 AM -----



Penny Rawlins -Martin
<eteruth@yahoo.com>

04/06/2009 10:43 AM

Please respond to
eteruth@yahoo.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Penny Rawlins-Martin
Lo#28 Kalamaula Hmstd.
P.O.Box 341

Kaunakakai HI 96748

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 10:18 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 10:17 AM -----



Frances Pitzer
<iam4joy@hotmail.com>

04/06/2009 09:51 AM

Please respond to
iam4joy@hotmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the
Aquaculture Project Ref # HA-3496

Aloha!

I am concerned about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its aquaculture project off the Kohala Coast. There has been insufficient information and details put forth for an informed decision to be made at this time.

Mahalo for your time.

Frances Pitzer
14 Hakoi Hema Place
Kihei, HI 96753

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 10:18 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Fw: Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 10:17 AM -----



Cathy Robinson
<cathiding@gmail.com>

04/06/2009 09:39 AM

Please respond to
cathiding@gmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Cathy Robinson
774 Willow Springs Drive
Mobile, AL 36695

Adaline F
Cummings/DLNR/StateHiUS
04/06/2009 09:27 AM

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS
cc
bcc
Subject Aquaculture questions

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Brad Parsons
<kauaibrad@hotmail.com>

04/04/2009 05:36 PM

Please respond to
kauaibrad@hotmail.com

To Adaline.F.Cummings@hawaii.gov
cc
Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Brad Parsons
P.O. Box 223374
Princeville, HI 96722

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Alea Schechter
<alealani@hawaii.rr.com>

04/04/2009 05:37 PM

Please respond to
alealani@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Alea Schechter
1777 Ala Moana Blvd. #813
Honolulu, HI 96815

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Tristen Wanke
<bluu1@yahoo.com>

04/04/2009 05:38 PM

Please respond to
bluu1@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Tristen Wanke
P.O. Box # 2
makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Robert Wagner
<rtwagner@bellsouth.net>

04/04/2009 05:53 PM

Please respond to
rtwagner@bellsouth.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Robert Wagner
3100 Sweetwater Rd
Apt. 3112
Lawrenceville, GA 30044

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



jamie gilmore
<jamie_gilmore@yahoo.com>

04/04/2009 06:10 PM

Please respond to
jamie_gilmore@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

jamie gilmore

po box 986
naalehu, HI 96772

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



"B.A. McClintock"
<redahi@hawaii.rr.com>

04/04/2009 06:17 PM

Please respond to
redahi@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

B.A. McClintock
Disabled-email only
Honolulu, HI 96825

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Denise Lytle
<squishytart@moose-mail.com>

04/04/2009 06:23 PM

Please respond to
squishytart@moose-mail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Denise Lytle
73 Poplar St.
Fords, NJ 08863

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



becky robison
<beckyr12p@gmail.com>

04/04/2009 06:27 PM

Please respond to
beckyr12p@gmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

becky robison
1049 uluopihi loop
kailua, HI 96734

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Kevin Brown
<kboom@wave.hicv.net>

04/04/2009 06:30 PM

Please respond to
kboom@wave.hicv.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

Kevin Brown
HC1 Box 628
Kaunakakai, HI 96748

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



suzanne garrett
<feetogo2@yahoo.com>

04/04/2009 06:39 PM

Please respond to
feetogo2@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

suzanne garrett
2023 lime st. #J
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Bill Akiona
<hoa.aina@yahoo.com>

04/04/2009 06:47 PM

Please respond to
hoa.aina@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Bill Akiona
P.O. Box 404
Waianae, HI 96792

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



"Capt. Paul Clark"
<sos@saveourseas.org>

04/04/2009 06:53 PM

Please respond to
sos@saveourseas.org

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Capt. Paul Clark
PO Box 813
Hanalei, HI 96714

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



gia baiocchi
<alohagia@mac.com>

04/04/2009 06:55 PM

Please respond to
alohagia@mac.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

gia baiocchi
po box 30899
Anahola, HI 96703

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Frederika Ebel
<lapuma7@hotmail.com>

04/04/2009 07:02 PM

Please respond to
lapuma7@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Frederika Ebel
PO Box 701
Flemington, NJ 08822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Randy Tashjian
<envirohero@hotmail.com>

04/04/2009 07:02 PM

Please respond to
envirohero@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Randy Tashjian
1031 Trafalger Drive
Glendale, CA 91207

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Nina Monasevitch
<oceanmana@hawaiiintel.net
>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 07:03 PM

Please respond to
oceanmana@hawaiiintel.net

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the

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Mahalo for your time.

Nina Monasevitch
4457 Laukini Rd.
Lihue, HI 96766

----- Forwarded by Adaline F Cummings/DLNR/StateHIUS on 04/06/2009 09:25 AM -----



Odette Rickert
<odette@numerologyreadings.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 07:39 PM

Please respond to
odette@numerologyreadings.com

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Odette Rickert
PO Box 12
PO Box 12
Hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Catherine Okimoto
<phoenixr3@yahoo.com>

04/04/2009 07:51 PM

Please respond to
phoenixr3@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Catherine Okimoto
RR4 Box 2251
14-869 Hapu'u Rd.
Pahoa, HI 96778

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



noel al-khatib
<teachsped63@msn.com>

04/04/2009 07:51 PM

Please respond to
teachsped63@msn.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi



Aloha!

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Mahalo for your time.

noel al-khatib
po box 343
hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Michael Howden
<michael@permaculturemaui.com>

To Adaline.F.Cummings@hawaii.gov
cc

04/04/2009 08:44 PM

Please respond to
michael@permaculturemaui.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Michael Howden
2020 Olinda RD
Makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



robert mceldowney
<robertdavid@warmlava.com>

To Adaline.F.Cummings@hawaii.gov
cc

04/04/2009 08:47 PM

Please respond to
robertdavid@warmlava.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

robert mceldowney
po box 450
laupahoehoe, HI 96764

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



elizabeth kane
<ekane@hawaii.edu>

04/04/2009 09:09 PM

Please respond to
ekane@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

elizabeth kane
2333 Kapiolani Blvd.
unit 312
honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Lehua Kaulukukui
<kananilehua@hawaii.rr.com>

To Adaline.F.Cummings@hawaii.gov



04/04/2009 09:13 PM

Please respond to
kananilehua@hawaii.rr.com

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.
Lehua Kaulukukui

Lehua Kaulukukui
68-1756 Puwala St.
68-1756 Puwala St. Waikoloa, HI 96738
Waikoloa, HI 96738

----- Forwarded by Adaline F Cummings/DLNR/StateHIUS on 04/06/2009 09:25 AM -----



"Toni A. Wolfson, RN"
<hummingdeer@yahoo.com>

04/04/2009 09:24 PM

Please respond to
hummingdeer@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

Adaline F
Cummings/DLNR/StateHiUS

To Dawn T Hegger/DLNR/StateHiUS@StateHiUS

cc

04/06/2009 09:27 AM

bcc

Subject Aquaculture questions

Adaline Cummings
Board of Land & Natural Resources
Secretary
1151 Punchbowl Street, Suite 130
Honolulu, Hawaii 96813
Phone: 808-587-0404
Fax: 808-587-0390

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Brad Parsons
<kauaibrad@hotmail.com>

To Adaline.F.Cummings@hawaii.gov

04/04/2009 05:36 PM

cc

Please respond to
kauaibrad@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Brad Parsons
P.O. Box 223374
Princeville, HI 96722

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Alea Schechter
<alealani@hawaii.rr.com>

04/04/2009 05:37 PM

Please respond to
alealani@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Alea Schechter
1777 Ala Moana Blvd. #813
Honolulu, HI 96815

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Tristen Wanke
<bluu1@yahoo.com>

04/04/2009 05:38 PM

Please respond to
bluu1@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetratech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

Tristen Wanke
P.O. Box # 2
makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



Robert Wagner
<rtwagner@bellsouth.net>

04/04/2009 05:53 PM

Please respond to
rtwagner@bellsouth.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Robert Wagner
3100 Sweetwater Rd
Apt. 3112
Lawrenceville, GA 30044

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



jamie gilmore
<jamie_gilmore@yahoo.com>

04/04/2009 06:10 PM

Please respond to
jamie_gilmore@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

jamie gilmore

po box 986
naalehu, HI 96772

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:26 AM -----



"B.A. McClintock"
<redahi@hawaii.rr.com>

04/04/2009 06:17 PM

Please respond to
redahi@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

B.A. McClintock
Disabled-email only
Honolulu, HI 96825

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Denise Lytle
<squishyart@moose-mail.com>

04/04/2009 06:23 PM

Please respond to
squishyart@moose-mail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Denise Lytle
73 Poplar St.
Fords, NJ 08863

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



becky robison
<beckyr12p@gmail.com>

04/04/2009 06:27 PM

Please respond to
beckyr12p@gmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

becky robison
1049 uluopihi loop
kailua, HI 96734

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Kevin Brown
<kboom@wave.hicv.net>

04/04/2009 06:30 PM

Please respond to
kboom@wave.hicv.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kevin Brown
HC1 Box 628
Kaunakakai, HI 96748

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



suzanne garrett
<feetogo2@yahoo.com>

04/04/2009 06:39 PM

Please respond to
feetogo2@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

suzanne garrett
2023 lime st. #J
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Bill Akiona
<hoa.aina@yahoo.com>

04/04/2009 06:47 PM

Please respond to
hoa.aina@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Bill Akiona
P.O. Box 404
Waianae, HI 96792

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



"Capt. Paul Clark"
<sos@saveourseas.org>

04/04/2009 06:53 PM

Please respond to
sos@saveourseas.org

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Capt. Paul Clark
PO Box 813
Hanalei, HI 96714

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



gia baiocchi
<alohagia@mac.com>

04/04/2009 06:55 PM

Please respond to
alohagia@mac.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

gia baiocchi
po box 30899
Anahola, HI 96703

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Frederika Ebel
<lapuma7@hotmail.com>

04/04/2009 07:02 PM

Please respond to
lapuma7@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Frederika Ebel
PO Box 701
Flemington, NJ 08822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Randy Tashjian
<envirohero@hotmail.com>

04/04/2009 07:02 PM

Please respond to
envirohero@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Randy Tashjian
1031 Trafalger Drive
Glendale, CA 91207

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Nina Monasevitch
<oceanmana@hawaiiintel.net
>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 07:03 PM

Please respond to
oceanmana@hawaiiintel.net

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Nina Monasevitch
4457 Laukini Rd.
Lihue, HI 96766

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Odette Rickert
<odette@numerologyreadings.com>

04/04/2009 07:39 PM

Please respond to
odette@numerologyreadings.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Odette Rickert
PO Box 12
PO Box 12
Hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Catherine Okimoto
<phoenixr3@yahoo.com>

04/04/2009 07:51 PM

Please respond to
phoenixr3@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Catherine Okimoto
RR4 Box 2251
14-869 Hapu'u Rd.
Pahoa, HI 96778

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



noel al-khatib
<teachsped63@msn.com>

04/04/2009 07:51 PM

Please respond to
teachsped63@msn.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi



Aloha!

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Mahalo for your time.

noel al-khatib
po box 343
hilo, HI 96721

----- Forwarded by Adaline F Cummings/DLNR/StateHIUS on 04/06/2009 09:25 AM -----



Michael Howden
<michael@permaculturemaui.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/04/2009 08:44 PM

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Please respond to
michael@permaculturemaui.com

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish

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Mahalo for your time.

Michael Howden
2020 Olinda RD
Makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



robert mceldowney
<robertdavid@warmlava.com
>

To Adaline.F.Cummings@hawaii.gov
cc

04/04/2009 08:47 PM

Please respond to
robertdavid@warmlava.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and

Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

robert mceldowney
po box 450
laupahoehoe, HI 96764

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



elizabeth kane
<ekane@hawaii.edu>

04/04/2009 09:09 PM

Please respond to
ekane@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

elizabeth kane
2333 Kapiolani Blvd.
unit 312
honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Lehua Kaulukukui
<kananilehua@hawaii.rr.com>

To Adaline.F.Cummings@hawaii.gov



04/04/2009 09:13 PM
 Please respond to
 kananilehua@hawaii.rr.com

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
 Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.
 Lehua Kaulukukui

Lehua Kaulukukui
 68-1756 Puwala St.
 68-1756 Puwala St. Waikoloa, HI 96738
 Waikoloa, HI 96738

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



"Toni A. Wolfson ,RN"
 <hummingdeer@yahoo.com>
 04/04/2009 09:24 PM
 Please respond to
 hummingdeer@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
 Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Toni A. Wolfson, RN
hummingdeer@yahoo.com
Felton, CA 95018

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Shawn White
<kaleimakamae@hotmail.com>

To Adaline.F.Cummings@hawaii.gov

>

cc

04/04/2009 09:46 PM

Please respond to
kaleimakamae@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Shawn White
PO Box 2502
Honolulu, HI 96804

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Fern Holland
<fernnnygirl@yahoo.com>

04/04/2009 10:24 PM

Please respond to
fernnnygirl@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Fern Holland
4664B Apopo Rd
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Pamela Polland
<peemer@kula.com>

04/04/2009 10:30 PM

Please respond to
peemer@kula.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Pamela Polland
226 Kulalani Drive
Kula, HI 96790

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Bobbi Lempert
<earthchild4ever@yahoo.com>

>

04/05/2009 10:12 AM

Please respond to
earthchild4ever@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Bobbi Lempert
PO Box 791881
Paia, HI 96779

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Leslie Yee Hoy
<lesyeehoy@yahoo.com>

04/05/2009 10:17 AM

Please respond to
lesyeehoy@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Leslie Yee Hoy
1305 Hele
Kailua, HI 96734

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Ron Dixon
<xidnor@yahoo.com>

04/05/2009 11:27 AM

Please respond to
xidnor@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Ron Dixon
po box 223403
Princeville, HI 96722

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Gregg Haines
<gshaines@earthlink.net>

04/05/2009 12:33 PM

Please respond to
gshaines@earthlink.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Questions on Ahi Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast.

While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on:

- Wild fish populations.
- Conflicts with marine mammals, endangered species and fishermen.
- Concerns about fish feed.
- Impacts on cultural resources.
- Impacts from the self-powered cages with their ocean thermal energy exchange, and how it may affect benthic and pelagic organisms.

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I urge the Department of Land and Natural Resources, Tetrattech and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Mahalo for your time.

Gregg Haines
2955 Kailiili Rd.
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



daniel greider
<buddha_stalin@verizon.net>

04/05/2009 01:33 PM

Please respond to
buddha_stalin@verizon.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

daniel greider
1747 billview dr
lanaster, PA 17601

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Tim Brause
<tbrause@yahoo.com>

04/05/2009 01:54 PM

Please respond to
tbrause@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Tim Brause
350 Ward Ave.
Suite 106-92
Honolulu, HI 96814

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Den Mark Wichar
<deedub@webtv.net>

04/05/2009 02:29 PM

Please respond to
deedub@webtv.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Answers Needed Re: DEIS for Ahi Aquaculture Project Ref #
HA-3496

Aloha!

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No fairness there!

It is imperative that HOTI address many issues before conservation lease is granted. I also urge Department of Land and Natural Resources, Tetrattech and Office of Environmental Quality Control to hold HOTI accountable and provide public with more informative and thorough EIS.

Mahalo.

Den Mark Wichar
711 W 25 St
Vancouver, WA 98660

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Mary Spadaro
<mlspadaro@yahoo.com>

04/05/2009 03:11 PM

Please respond to
mlspadaro@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Mary Spadaro
980 Prospect St. #2
Honolulu, HI 96822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Mary Spadaro
<mlspadaro@yahoo.com>

04/05/2009 03:12 PM

Please respond to
mlspadaro@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Mary Spadaro
980 Prospect St. #2
Honolulu, HI 96822

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Tara Cornelisse
<tara.cornelisse@gmail.com>

04/05/2009 03:25 PM

Please respond to
tara.cornelisse@gmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Tara Cornelisse
2071 huckleberry rd.
San Rafael, CA 94903

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Keoki Baclayon
<baclayon@hawaii.edu>

04/05/2009 04:12 PM

Please respond to
baclayon@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
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Mahalo for your time.

Keoki Baclayon
91-1209 Kaneana St J-7
Ewa Beach, HI 96706

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



chris kobayashi
<waioli2@hawaiiantel.net>

04/05/2009 04:29 PM

Please respond to
waioli2@hawaiiantel.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

What kind of feed will they feed the fish? GMO feed?
Which have never been proven to be safe for animals and humans to eat. Let
alone, exposing that to our ocean waters.

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

chris kobayashi
pob
hanalei, HI 96714

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Deanna Chang
<changdidi@hotmail.com>

04/05/2009 04:41 PM

To Adaline.F.Cummings@hawaii.gov

cc



Please respond to changdidi@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Deanna Chang
4223 Kaimanahila St.
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Michael Maddux
<maddux@aloha.net>

04/05/2009 04:53 PM

Please respond to maddux@aloha.net

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Michael Maddux
PO Box 1596
P.O. Box 1496
Kapaau, HI 96755-1496

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Amara Karuna
<amara@mindspring.com>

04/05/2009 05:20 PM

Please respond to
amara@mindspring.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Amara Karuna
PO box 1430
Pahoa, HI 96778

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Sara Bartlett-Valente
<kulanalu@yahoo.com>

04/05/2009 05:56 PM

Please respond to
kulanalu@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Sara Bartlett-Valente
59-618 Akanoho Pl.
Haleiwa, HI 96712

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----





Kuuleilani Reyes
<kuufantagi@hotmail.com>

04/05/2009 06:01 PM

Please respond to
kuufantagi@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kuuleilani Reyes
3385 Likini Street
Honolulu, HI 96818

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Katherine Ross
<kcross@hawaii.rr.com>

04/05/2009 06:18 PM

Please respond to
kcross@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Katherine Ross
PO Box 603
Papaikou, HI 96781

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Ken Ng <caide65@aol.com>

04/05/2009 06:54 PM

Please respond to
caide65@aol.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Ken Ng
3557 Butler Ave,
LA, CA 90066

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Kaitlyn McKee
<silversurferkauai@hotmail.com>
m>

To Adaline.F.Cummings@hawaii.gov
cc

04/05/2009 07:43 PM

Please respond to
silversurferkauai@hotmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Kaitlyn McKee
P.O. Box 2196
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Leona Toler
<Kealanohea@yahoo.com>

04/05/2009 08:35 PM

Please respond to
Kealanohea@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Leona Toler
195 Todd Avenue
Hilo, HI 96720-4850

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



Eve Powers
<sacredearth@hawaii.rr.com>

04/05/2009 09:15 PM

Please respond to
sacredearth@hawaii.rr.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time. Eve Powers, Kapaa, HI

Eve Powers
1262 Crossley Rd.
Kapaa, HI 96746

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:25 AM -----



madeleine migenes
<madmig@hotmail.com>

04/05/2009 10:34 PM

Please respond to
madmig@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

madeleine migenes
2590 Aloha Street
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



madeleine migenes
<madmig@hotmail.com>

04/05/2009 10:34 PM

Please respond to
madmig@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

madeleine migenes
2590 Aloha Street
Haiku, HI 96708

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Kalani Kalima
<kalanzo@hotmail.com>

04/06/2009 12:26 AM

Please respond to
kalanzo@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kalani Kalima
810 N. Vineyard
810 N. Vineyard
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Kalani Kalima
<kalanzo@hotmail.com>

04/06/2009 12:26 AM

Please respond to
kalanzo@hotmail.com

To Adaline.F.Cummings@hawaii.gov

cc

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Aquaculture Project Ref # HA-3496

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Mahalo for your time.

Kalani Kalima
810 N. Vineyard
810 N. Vineyard
Honolulu, HI 96816

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



James Lopez

04/06/2009 02:52 AM

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi Aquaculture Project Ref # HA-3496

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Mahalo for your time.

James Lopez

Topeka, KS

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Mary Beth Murrill
<marybethmurrill@yahoo.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/06/2009 04:33 AM

Please respond to
marybethmurrill@yahoo.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

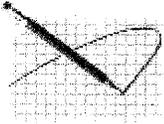
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Mahalo for your time.

Mary Beth Murrill
Altadena, CA 91001

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Carolyn Moore

04/06/2009 04:41 AM

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Carolyn Moore

Mesa, AZ 85215

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Ravi Grover
<avatar11@rediffmail.com>

04/06/2009 06:54 AM

Please respond to
avatar11@rediffmail.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject re: DEIS for the Ahi Aquaculture Project Ref # HA-3496

Hawaiian waters are a public resource. HOTI essentially is asking the citizens of Hawaii to lease our land to a private company for profit that could cause substantial harm to public resources. Whatever impacts HOTI will have on existing natural resources will be shared by all of us, while profits will be only theirs. Therefore, it is imperative that HOTI address many issues before a conservation lease is granted. I also urge the Department of Land and Natural Resources, Tetratex and the Office of Environmental Quality Control to hold HOTI accountable and provide the public with a more informative and thorough EIS.

Ravi Grover
POB 802103
Chicago, IL 60680

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Lisa Galloway
<lisa.m.galloway@gmail.com>

To Adaline.F.Cummings@hawaii.gov

cc

04/06/2009 06:55 AM

Please respond to
lisa.m.galloway@gmail.com

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I write about the DEIS to farm ahi off the Big Island coast. I know that salmon farming is not done correctly and results in parasites and diseases affecting wild fish, and fish farm pollution adversely affecting the aquatic environment. As fish farming can be done sustainably and respectfully, it is important that it be set up on a small scale first, monitored carefully and that mistakes made be the responsibility of those who intend to profit. It is important that the public is informed and heard about such new industries in our backyard, our ocean.

Like KAHEA, I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

Lisa Galloway
Nahaku Place
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



pete sayer
<epyachts@aol.com>

04/06/2009 07:38 AM

Please respond to
epyachts@aol.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Mahalo for your time.

pete sayer
pobox767
makawao, HI 96768

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Garid Faria



<garid@hawaii.edu>

04/06/2009 08:53 AM

Please respond to
garid@hawaii.edu

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Garid Faria
2605 La'au St.#101
2605 La'au St., Apt 101
Honolulu, HI 96826

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Angel Prince
<amprince2000@yahoo.com>

04/06/2009 09:00 AM

Please respond to
amprince2000@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Angel Prince
PO Box 1991
Honokaa, HI 96727

----- Forwarded by Adaline F Cummings/DLNR/StateHiUS on 04/06/2009 09:24 AM -----



Dean Otsuki
<dolive2surf@yahoo.com>

04/06/2009 09:06 AM

Please respond to
dolive2surf@yahoo.com

To Adaline.F.Cummings@hawaii.gov

cc

Subject Please Answer Our Questions on the DEIS for the Ahi
Aquaculture Project Ref # HA-3496

Aloha!

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Mahalo for your time.

Dean Otsuki
p.o. box 25284
Honolulu, HI 96825

Bill Spencer
Hawaii Oceanic Technology
425 South Street
Suite 2902
Honolulu, HI 96813
US

WA XATE

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetratech, Office of Environmental Quality Control

I have significant concerns about the DEIS that Hawaii Oceanic Technology, Inc. has submitted regarding its ahi aquaculture project off the Kohala Coast. While the proposed lease site is three times the size of any existing ocean fish farming operation in HI and aims to produce forty-eight times more fish than another local farm it claims to be similar to, HOTI's DEIS fails to sufficiently address the effects of the proposed farm on: wild fish populations; conflicts with marine mammals, endangered species and fishermen; concerns about fish feed; impacts on cultural resources; impacts from the self-powered cages with their ocean thermal energy exchange that pulls up seawater from below each cage, and how it may affect benthic and pelagic organisms; overall economic impacts on Hawaii and related U.S. markets to which the fish will be exported.

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Sincerely,

Byron Barth
3501 Saint Elizabeth Road
Glendale, CA 91206

Bill Spencer
Hawaii Oceanic Technology
425 South Street
Suite 2902
Honolulu, HI 96813
US

LATE

Mr. Spencer, ,

CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Eric Brandt
4211 Waiialae Ave. Ste. 8090
Honolulu, HI 96816

808-226-3624

Bill Spencer
Hawaii Oceanic Technology
425 South Street
Suite 2902
Honolulu, HI 96813
US

LWAY LATE

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CC: Department of Land and Natural Resources, Tetrattech, Office of Environmental Quality Control

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Sincerely,

Larry Boring
1428 N Orange Grove Ave.
Los Angeles, CA 900a46-390