United States Environmental Protection Agency

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US Army Corps of Engineers®

DRAFT
Environmental Assessment (EA)

National Pollutant Discharge Elimination System (NPDES) Permit and Rivers and Harbor Act Section 10 Permit for Kampachi Farms – Velella Epsilon (VE) Offshore Aquaculture Project

Abbreviations Used in this Document

Abbreviation	Definition
ACL	Annual Catch Limit
APHIS	Animal and Plant Health Inspection Service
ATON	Aids to Navigation
BACT	Best Available Control Technology
BES	Baseline Environmental survey
BOEM	Bureau of Ocean Energy Management
BPJ	Best Professional Judgement
BSEE	Bureau of Safety and Environmental Enforcement
^{o}C	Degree Celsius
CAA	Clean Air Act
CAAP	Concentrated Aquatic Animal Production
CASS	Coastal Aquaculture Siting and Sustainability
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Chl-a	Chlorophyll a
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DA	Department of Army
DO	Dissolved Oxygen
DOC	Department of Commerce
DOD	Department of Defense
DOI	Department of Interior
DPS	Distinct Population Segment
DWH	Deepwater Horizon Event
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
ELG	Effluent Limitations Guidelines
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMP	Fishery Management Plan
FR	Federal Register
ft	Feet
FWS	U.S. Fish and Wildlife Service
GAP	Gulf Aquaculture Permit

GOMESA	Gulf of Mexico Energy Security Act
GPS	Global Positioning System
Gulf	Gulf of Mexico
HAB	Harmful Algal Blooms
HAPCs	Habitats of Particular Concern
kg/day	Kilograms per Day
km	Kilometer
lbs. gw	Pounds Gross Weight
LOP	Letter of Permission
m	Meters
MAS	Multi-Anchor System
MBTA	Migratory Bird Treaty Act
mg/l	Milligram per Liter
MMAP	Marine Mammal Authorization Program
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MPAs	Marine Protected Areas
MSA	Marine Sanctuary Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
nmi	Nautical Mile
NMSA	National Marine Sanctuaries Act
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWR	National Wildlife Refuge
OCS	Outer Continental Shelf
ODCE	Ocean Discharge Criteria Evaluation
ODMDS	Ocean Dredged Material Disposal Site
PAHs	Polyaromatic Hydrocarbons
PATON	Private Aids to Navigation
PCBs	Polychlorinated Biphenyls
PDARP	Final Programmatic Damage Assessment and Restoration Plan
PEIS	Programmatic Environmental Impact Statement
PFEIS	Programmatic Final Environmental Impact Statement
PM	Particulate Matter
ppt	Parts per Thousand
PSD	Prevention of Significant Deterioration
PSMP	Protected Species Management Plan

RAS	recirculating aquaculture system
RUE	Right of Use and Easement
SEFSC	Southeast Fisheries Science Center
SLA	Submerged Lands Act
SPCC	Spill Prevention, Containment, and Countermeasure
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TP	Total Phosphorous
ug/L	Microgram per Liter
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
WTCW	Well Treatment, Completion, and Workover (fluids)

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1.0 Introduction

Kampachi Farms, LLC (applicant) is proposing to install and operate a pilot-scale marine aquaculture facility in federal waters of the Gulf of Mexico (Gulf) and has applied for permits from multiple federal agencies (See Table 1). An interagency workgroup consisting of the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE) and National Marine Fisheries Service (NMFS), has prepared this environmental assessment (EA) to evaluate the potential environmental impacts of the construction and operation of the proposed project, named Velella Epsilon (VE).

This EA was prepared by the EPA as the lead federal agency with assistance from the NMFS and USACE as cooperating agencies under the National Environmental Policy Act (NEPA). Cooperating agencies have jurisdiction by law or special expertise with respect to the potential environmental impacts resulting from the VE project. All three federal agencies have jointly prepared this EA in compliance with the requirements of the NEPA Title 40 CFR Parts 1500-1508 regulations, and each Agencies' implementing regulations.

A NEPA review is required when the EPA issues a NPDES permit for a "new source" under the Clean Water Act (CWA). At this time, the proposed facility does not meet the definition of "new source," which includes facilities subject to and commencing construction after the promulgation of national standards of performance under Section 306 of the CWA (40 CFR Section 122.2). The proposed facility will commence construction after promulgation of national standards of performance for CAAP facilities set forth at 40 CFR Part 451; however, those standards do not apply to facilities producing less than 100,000 pounds of aquatic animals annually (the proposed facility will produce a maximum of 88,000 pounds of aquatic animals per year). Thus, the obligation to conduct NEPA review for issuance of "new source" permits does not directly apply to the proposed permit.

While the NEPA regulations are not automatically applicable to the proposed facility, the EPA finds that a NEPA analysis will be beneficial. It is appropriate to perform a NEPA review in accordance with EPA's *Policy for Voluntary Preparation of NEPA Documents* (63 Federal Register 58045; October 29, 1998) based on the facility-specific circumstances surrounding the issuance of the NPDES permit. First, preparing a NEPA evaluation will enhance and facilitate an analysis of environmental impacts that are not well known because the proposed facility would be the first aquaculture facility to operate and discharge in federal waters of the eastern Gulf. Second, the EPA's decision to prepare an EA is also supported by 40 CFR Section 6.205(a), which provides for preparation of an EA when a proposed action is expected to result in environmental impacts and the significance of the impacts are not known. Third, improved coordination and efficiencies with other federal agencies will occur because these Agencies are already required to prepare NEPA documentation for related permitting actions. Finally, the proposed facility's maximum annual production of 88,000 lbs. is relatively close to the threshold for meeting the new source definition for which EPA's NEPA requirements under 40 CFR Part 6 are automatically applicable.

Following the approval of the Aquaculture Memorandum of Understanding MOU between Federal agencies, and in consideration of the EPA's Policy for Voluntary Preparation of NEPA Documents and the implementing regulations of NEPA (i.e. 40 CFR Part 1500-1508), the EPA elected to act as the lead Federal agency for the creation of a single EA given that the action of permitting the proposed project

involves more than one federal agency. The NMFS and USACE are cooperating agencies for the development of the EA. The completion of a jointly created EA and potential finding of no significant impact will satisfy EPA's obligations under NEPA.

As the lead federal agency, the EPA prepared this EA in accordance with the Title 40 Part 6 regulations. In addition, the EPA requested that the Bureau of Ocean Energy Management (BOEM), the U.S. Fish and Wildlife Service (FWS), Bureau of Safety and Environmental Enforcement (BSEE), and the U.S. Coast Guard (USCG) participate in this process as participating agencies.

The roles of each federal agency in the VE project review process are described throughout this EA. This document provides a basis for coordinated federal decision-making in a single document, avoiding duplication among federal agencies (or other state agencies with federal delegation authority) using the NEPA environmental review process. In addition to the lead and cooperating agencies, other federal, state, and local agencies may use this EA in approving or issuing authorizations for this project. The major federal, state, and local consultations associated with the proposed project are discussed in the following sections: Regulatory Background (Section 1.1), Primary Federal Authorizations needed for Proposed Aquaculture Projects (Section 1.2) and Required Federal Consultations, Review, and Other Applicable Laws (Section 1.3).

Through the preparation of this 'voluntary' EA and supporting studies, the EPA will also help streamline the NEPA process for any future aquaculture permitting actions, establish a monitoring and assessment baseline of important water quality issues associated with similar discharges, and provide an increased opportunity for public and stakeholder comments.

1.1 Regulatory Background

The operator of an offshore aquaculture facility must obtain required federal permits and authorizations prior to beginning operations (*e.g.*, USACE Section 10 permit needed before anchoring any structures into federal waters of the Gulf and EPA's NPDES permit needed before stocking animals into those structures). Table 1 summarizes the permits that are needed to conduct aquaculture in federal waters of the Gulf.

Table 1: Federal Permits needed for offshore aquaculture projects.

Agency	Statutes/ Authorities	Purpose	Permit
U.S. Army Corps of Engineers (USACE)	Section 10 of the Rivers and Harbors Act	Required in navigable waters of the U.S. to protect navigation for commerce	Section 10 Permit
U.S. Environmental Protection Agency (EPA)	Sections 402 and 403 of the Clean Water Act	Required for the discharge of pollutants into waters of the U.S.	NPDES Permit

Additional details regarding the statutory/regulatory framework that supports offshore aquaculture permitting are provided in the following sections.

1.1.1 EPA--Clean Water Act

In accordance with the CWA, all pollutant discharges must comply with specific legal requirements. The CWA defines pollutant as dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. The CWA established the NPDES program to protect and improve water quality by regulating point-source discharges into waters of the United States. Pursuant to its CWA authority, the EPA developed the NPDES Permit Program to permit pollutant discharges.

Discharges from aquaculture operations are primarily governed by the implementing regulations of CWA Sections 402 and 403. The CWA Section 402 authorizes the EPA to issue NPDES permits for the discharge of pollutants from point sources into waters of the United States. The CWA Section 402 requires that a NPDES permit for a discharge into federal waters of the ocean be issued in compliance with EPA's ocean discharge criteria within CWA Section 403 for preventing unreasonable degradation of the receiving waters (i.e., 40 CFR Section 125.121). Potential pollutant discharges from aquaculture operations include solids, nutrients, ammonia, fish waste, feed waste, pharmaceuticals, chemicals, and other industrial animal-processing byproducts. The proposed facility will require a NPDES permit because it proposes to discharge pollutants from a point source to waters of the United States and, therefore, is subject to the general CWA Section 301 prohibition against discharges unless authorized by a NPDES permit.

Relevant to the proposed action is the CWA implementing NPDES regulation relating to concentrated aquatic animal production (CAAP) facilities under 40 CFR Section 122.24, which requires technology-based effluent limitations for certain discharges of pollutants from CAAP facilities. The discharges from the proposed facility are not regulated as a CAAP because the facility does not meet the fish production thresholds for the warm water category. Therefore, the discharge of pollutants from the facility will be regulated as an aquatic animal production facility and the NPDES permit for the proposed facility will include the CAAP effluent limitations based on best professional judgement as allowed by 40 CFR Section 125.3(c).

Effective in 2004, the CAAP performance standards and effluent-limit guidelines (ELGs) are set forth in 40 CFR Part 451 and consist of a series of management practices designed to control pollutant discharges. These standards and guidelines were developed for CAAP facilities producing over 100,000 pounds annually in net pens or submerged cage systems. Based on maximum production levels provided by the applicant, the proposed action will not meet that production threshold. However, while the Part 451 effluent guideline limitations are not directly applicable, the NPDES permit for the facility will adopt those same requirements in the permit based on the best professional judgment (BPJ) of the permit writer and based on the factors set forth in 40 CFR Part 125, Subpart A. An individual permit is required because no general permit is available for off-shore aquatic animal production or CAAP operations within federal waters of the Gulf. NPDES permits usually are issued for 5-year terms and reissued every 5 years.

The CWA's jurisdiction extends over navigable waters, territorial seas, the waters of the contiguous zone, and the oceans. The CWA defines navigable waters to include the territorial seas, which are defined as the belt of seas measured from the ordinary, low-water line in direct contact with the open sea

and the line marking the seaward limit of inland waters and extending seaward 3 miles. The contiguous zone is the entire zone established under Article 24 of the Convention of the Territorial Sea and the Contiguous Zone, and any portion of the high seas beyond this zone is defined as the ocean. In most places, federal waters extend from where state waters end out to about 200 nautical miles (nmi) also known as the U.S. Exclusive Economic Zone (EEZ).[1]

The CWA Section 403 requires all offshore pollutant discharges to have permit limits consistent with EPA's ocean discharge criteria, which are the EPA's regulations to prevent unreasonable degradation of the marine environment in connection with discharges to the territorial seas, the contiguous zone, and the oceans. Consequently, all CWA Section 402 permitted discharges into the territorial sea, the waters of the contiguous zone, or the oceans must be consistent with CWA Section 403 criteria.

Additionally, depending upon the proposed design and operations, aquaculture facilities may also be subject to federal requirements under the Animal and Plant Health Inspection Service (APHIS) which is administered by the U.S. Department of Agriculture, the Spill Prevention, Containment, and Countermeasure (SPCC) regulations, or the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and NEPA (EPA, 2006).

1.1.2 USACE--Section 10

The proposed action requires the issuance of a Department of the Army (DA) permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403). Section 10 requires prior authorization for structures and work in, over, under, and affecting navigable waters. Under this authority, operators must obtain a Section 10 permit prior to installing any offshore aquaculture infrastructure, such as net pens and lines, provided that it is an "installation or other device" and is attached to the seabed.

1.2 Primary Federal Authorizations needed for Proposed Aquaculture Projects

In addition to required federal permits, other federal authorizations may be needed to support commencement of offshore aquaculture projects in federal waters. For example, if an aquaculture facility is co-located within the outer continental shelf (OCS) oil and gas facilities (this is not the case with the VE project), the BOEM and the BSEE must review and provide certain approvals which would be incorporated into the federal permitting processes (i.e., no separate authorizations would be issued). Once all federal permits have been obtained, applicants must apply to the USCG to receive an authorization to deploy Private Aids to Navigation (PATON), (*e.g.*, markers, buoys, at their approved aquaculture operation site). Table 2 provides a summary of the federal authorizations that may be needed for offshore marine aquaculture projects in federal waters.

[1] EPA has delegated the NPDES program to the State of Florida for projects in state waters. The State of Florida's NPDES jurisdiction extends three miles offshore. The CWA requires the EPA to issue NPDES permits for pollutant discharges beyond three miles seaward offshore Florida. For purposes of this EA, nautical mile is used interchangeably with geographic miles (i.e., CWA) to be distinguished from statutory miles. For example, 9 nmi equals 8.99 geographic miles versus 10.36 statute miles.

Table 2: Federal authorizations required for Offshore Aquaculture Projects.

Agency	Statutes/Authorities	Purpose	Application Form(s)/Process4	Who initiates this action and how?	Form of authorization
Authorizations					
U.S. Coast Guard (USCG)	33 U.S.C. 1221 *et seq* 33 CFR Section 66	Ensure safe navigation Authorize Private Aids To Navigation	Private Aids to Navigation Application Form (CG-2554)	Applicant seeking to establish a private aid to navigation	Formal authorization from appropriate USCG District
Authorizations for Aquaculture Operations Co-Located with OCS Oil and Gas Facilities					
Bureau of Ocean Energy Management (BOEM)	Outer Continental Shelf Lands Act; Energy Policy Act of 2005; 30 CFR Section 500-599	Required for any offshore aquaculture operations that utilize or tether to existing oil and gas facilities	Right of Use and Easement (RUE) for Energy and Marine- Related Activities Using Existing OCS Facilities	Operator of the OCS aquaculture facility proposing to initiate offshore aquaculture activities submits request for an Alternate Use RUE after contacting and receiving approval from the OCS Oil and Gas Facility Owner	A formal RUE is established using the facility for the purpose of aquaculture
Bureau of Safety and Environmental Enforcement (BSEE)	Outer Continental Shelf Lands Act			Permitting agencies request BSEE consultation on proposed aquaculture activities	

1.3 Required Federal Consultations, Reviews, and Other Applicable Laws

The EPA and the USACE must also coordinate with other agencies when making permitting decisions for offshore aquaculture operations. Table 3 provides a summary of these applicable laws and coordination efforts. Additional information about the coordination and consultation efforts to comply with other applicable federal laws is provided in Chapter 7 and in the Appendices of this EA.

Table 3. Other Applicable Federal Laws

	Description of the Requirement
Endangered Species Act	Section 7 of the Endangered Species Act (ESA) requires any federal agency that issues a permit to consult with NOAA's National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS), if issuance of the permit may adversely affect ESA- listed species and/or the designated critical habitat for ESA-listed species. The Section 7 consultation process requires an analysis of the effects of the proposed action on ESA-listed species and designated critical habitat based on the best available science. The analysis must determine if the proposed action is likely to adversely affect an ESA-listed species and/or designated critical habitat. If the analysis determines the issuance of a proposed permit may adversely affect an ESA-listed species, but will not jeopardize its continued existence, then reasonable and prudent measures and implementing terms and conditions that minimize the adverse impacts must be developed.
Essential Fish Habitat	The Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act requires federal agencies to consult with NMFS when activities they undertake or permit have the potential to adversely affect EFH.
National Historic Preservation Act	Section 106 of the National Historic Preservation Act (36 CFR Part 800) requires any federal agency issuing a permit to account for potential effects of the proposed aquaculture activity on historic properties, e.g., shipwrecks, prehistoric sites, cultural resources. If a proposed aquaculture activity has the potential to affect historic properties, these details must be provided by the applicant as part of the application packages.
Fish and Wildlife Coordination Act	The Fish and Wildlife Coordination Act requires any federal agency issuing permits to consult with USFWS and NMFS if the proposed aquaculture activities could potentially harm fish and/or wildlife resources. These consultations may result in project modification and/or the incorporation of measures to reduce these effects.
National Marine Sanctuary Resources Act	Section 304(d) of the National Marine Sanctuaries Act (NMSA) requires that any federal agency issuing permits to consult with NOAA's National Marine Sanctuary Program (NMSP) if the proposed aquaculture activity is likely to destroy or injure sanctuary resources. As part of the consultation process, the NMSP can recommend reasonable and prudent alternatives. While such recommendations may be voluntary, if they are not followed and sanctuary resources are destroyed or injured in the course of the action, the NMSA requires the federal action agency(ies) issuing the permit(s) to restore or replace the damaged resources.
Marine Mammal Protection Act	The Marine Mammal Protection Act (MMPA) prohibits the harassment, hunting, capturing or killing of marine mammals without a permit from either the Secretary of the Interior or the Secretary of Commerce. Section 118 of the MMPA addresses the incidental capture of marine mammals during commercial fishing operations. Section 118 also establishes the Marine Mammal Authorization Program (MMAP), which provides a mechanism for commercial fishermen to receive an exemption to the prohibitions against capturing marine mammals. To be eligible for the exemption, any commercial vessel or non-vessel gear (e.g., aquaculture facilities) engaging in a Category I or II fishery must obtain a MMAP certificate from NMFS or a designated agent. Fishery categories are published in the annually reviewed and revised NMFS, which is available on the NMFS website and in the Federal Register.
National Environmental Policy Act	The National Environmental Policy Act (NEPA) requires federal agencies to prepare either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) for any federal action affecting the quality of the human environment; unless it is determined the activity is categorically excluded from NEPA. NOAA has completed a Programmatic EIS (PEIS), which broadly considers a range of similar aquaculture projects in the Gulf. Federal agencies, in particular EPA and USACE, will ensure that any additional site specific assessments deemed necessary are conducted. Permit applicants may be required to provide support for the project-specific evaluation of alternatives and their environmental effects, such as providing estimates of nutrient loadings, an assessment of the potential for benthic impacts, or effects on native species.
Coastal Zone Management Act	The Coastal Zone Management Act of 1972 (CZMA) encourages coastal states to develop and implement coastal zone management plans as a basis for protecting, restoring, and establishing a responsibility in preserving and developing the nation's coastal communities and resources. Coastal states with an approved coastal zone management program are authorized to review certain federal actions affecting the land or water uses or natural resources of its coastal zone for consistency with its program. Under the CZMA, a state may review: activities conducted by, or on behalf of, a federal government agency within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone; an application for a federal license or permit; and any plan for the exploration or development or, or production from, any area that has been leased under the Outer Continental Shelf Lands Act for offshore minerals exploration or development. The CZMA requires federal agency activities to be consistent to the maximum extent practicable with the enforceable policies of a state's approved coastal zone management program.

1.4 Proposed Action

The applicant is proposing a pilot-scale project where up to 20,000 Almaco jack (*Seriola rivoliana*, i.e., Kampachi) fingerlings will be reared in a single net pen aquaculture system in federal waters approximately 45 miles west, southwest of Longboat Pass-Sarasota Bay, Florida. Project details are provided in *Section 1.6.3 Summary of Proposed Project Activities*.

The proposed action is the issuance of a permit under the respective authorities of the EPA and the USACE as required to operate the facility. The EPA's proposed action is the issuance of a NPDES permit that authorizes the discharge of pollutants from an aquatic animal production facility that is considered a point source into federal waters of the United States. The USACE's proposed action is the issuance of a DA permit pursuant to Section 10 that authorizes anchorage to the sea floor, and structures affecting navigable waters.

1.5 Purpose and Need for the Proposed Action

The applicant seeks permits and authorizations for the VE project which is a single net pen demonstration project for open ocean aquaculture of marine finfish in federal waters of the Gulf. The EPA and the USACE are the two federal agencies that are statutorily required to issue permits and authorizations for this type of operation. The EPA and USACE agency specific purpose and need for the proposed project are as follows:

EPA

On November 9, 2018, the EPA Region 4 received a complete application for a NPDES permit from the applicant (Kampachi Farms) for the discharge from a marine aquaculture facility into federal waters of the Gulf. The proposed action is the issuance of a new NPDES individual permit for discharges from a new aquaculture facility into federal waters of the Gulf. The proposed facility would be the first aquaculture facility to operate and discharge in federal waters of the eastern Gulf and, thus, the significance of any impacts to the environment from such a facility is not known. Consistent with 40 CFR Section 6.205(a), the EA was prepared for the proposed action under EPA's *Voluntary Policy for the Preparation of NEPA Documents*. The applicant needs an NPDES permit in order to operate and discharge from its proposed aquaculture facility in compliance with the CWA.

USACE

On December 13, 2017, a DA application was submitted to Fort Myers Permit Section for the VE project. The application was determined complete, but the applicant indicated that the project location and equipment was likely to change as a result of the NMFS exempted fishing permit (EFP) application process (the EFP process was discontinued after the September 2018 court ruling regarding NMFS' authority to regulate aquaculture as fishing under the Magnuson-Stevens Act in the Gulf). The application was withdrawn on March 23, 2018, until the project details were finalized. On November 10, 2018, the USACE Jacksonville District received a complete application for a DA permit pursuant to Section 10 for structures and work affecting navigable waters from Kampachi Farms. The USACE will be evaluating the project for a DA authorization via a Letter of Permission (LOP) pursuant to Section 10. For the purposes of this EA, the Section 10 Permit and LOP will be used interchangeably. The LOP will be valid for 5 years. In contrast, the application proposes a pilot-scale aquaculture system that will

raise approximately 20,000 Almaco jack over a 12-14 month project period. An LOP was determined appropriate for this action due to the small scale and temporary nature of the proposed pilot project.

The proposed action is the issuance of a USACE permit pursuant to Section 10 of the Rivers and Harbors Act of 1899. Section 10 requires prior authorization for structures and work in, over, under, and affecting navigable waters. Under this authority, operators must obtain a Section 10 permit prior to installing any offshore aquaculture infrastructure, such as net pens and lines, provided that it is an "installation or other device" and is attached to the seabed. The applicant needs a DA authorization in order to operate its proposed aquaculture facility in compliance with Section 10.

1.6 Site Selection

Two potential site locations, approximately five nautical miles apart, were identified along the 40-meter (m) isobath after an extensive preliminary siting analysis conducted with NOAA's National Ocean Service National Centers for Coastal Ocean Science (NOS NCCOS) staff. Preliminary analysis used a number of site criteria including: proximity to a commercial port, adequate water depths (at least 130 ft) to allow net pen submersion and maximize mooring scope, avoidance of hardbottom habitats, artificial reefs and submerged cultural resources (e.g., shipwrecks), areas consisting of unconsolidated sediments for positioning the anchors, avoidance of marine protected areas (MPAs), marine reserves, and Habitats of Particular Concern (HAPCs). Selection criteria also considered the presence of navigational fairways, vessel traffic routes, anchoring areas, lightering zones, deepwater ports, platform safety zones, military zones, fisheries and tourism areas, dredging sites, mineral extraction areas, designated dredge material dumping sites, rights of way for energy transmission lines and communications cables, and scientific reference sites and fishery conflicts.

A baseline environmental survey (BES) (Appendix A) of both sites was commissioned by the applicant to determine if the sites were clear of sensitive live bottom habitat, potential hazards, and potential archeological and historic features not present in the data sets used in the preliminary site analysis. The BES was also used for engineering analysis by determining whether selected sites contained sufficiently deep layers of unconsolidated sediments suitable for cage anchors. Benthic surveys using sidescan sonar, sub-bottom profiling, and towed magnetometer data determined that the seafloor at both locations were free of any exposed pipelines, marine debris, underwater wrecks and cultural resources. This site screening process informed federal agencies of viable action alternatives and non-viable alternatives as part of the NEPA process.

1.6.1 Description and Location

The proposed facility will be located within the boundary of the coordinates shown in *Table 4*. The boundary of the facility is ~45 miles southwest of Sarasota, Florida and consist of water depths of ~130 feet which is conducive for placement of the single cage and multi-anchor system (MAS).

The applicant will select a specific location within that area based on diver-assisted assessments of the sea floor when the cage and MAS are deployed. See *Appendix A* for additional information on the project boundary.

Table 4. Velella Epsilon Boundary Coordinates

Location	Latitude	Longitude
Upper Left Corner	27° 7.70607' N	83° 12.27012' W
Upper Right Corner	27° 7.61022' N	83° 11.65678' W
Lower Right Corner	27° 6.77773' N	83° 11.75379' W
Lower Left Corner	27° 6.87631' N	83° 12.42032' W

1.6.2 Surrounding Location Uses

The proposed area is located on a portion of the west Florida Shelf that is heavily trawled by the shrimp fishing industry. Additionally, large portions of the west Florida Shelf are designated as military special use airspace. To avoid user conflicts in this area, the applicant coordinated closely with the military and the shrimping industry during the site selection process.

1.6.3 Summary of Proposed Project Activities

The proposed project would allow the applicant to operate a pilot-scale marine aquaculture facility with up to 20,000 Almaco jack (*Seriola rivoliana*; i.e., Kampachi) being reared in federal waters for a period of approximately 12 months (total deployment of the cage system is 18 months). Based on an estimated 85 % (percent) survival rate, the operation is expected to yield approximately 17,000 fish. Final fish size is estimated to be approximately 4.4 lbs./fish, resulting in an estimated final maximum harvest weight of 88,000 lbs. (or 74,800 lbs. considering the survival rate). The fingerlings will be sourced from brood stock that are located at Mote Aquaculture Research Park and were caught in the Gulf near Madeira Beach, Florida. As such, only F1 progeny will be stocked into the proposed project. Following harvest, cultured fish would be landed in Florida and sold to federally-licensed dealers in accordance with state and federal laws.

A single CopperNet offshore strength (PolarCirkel-style) submersible fish pen will be deployed on an engineered multi-anchor swivel (MAS) mooring system. The design provided by the applicant for the engineered MAS will use three concrete deadweight anchors for the mooring system or embedment anchors. The cage material for the proposed project is constructed with rigid and durable materials (copper mesh net with a diameter of 4 millimeter (mm) wire and 40mm x 40 mm mesh square). The mooring lines for the proposed project will be constructed of steel chain (50mm thick) and thick rope (36mm) that are attached to a floating cage that will rotate in the prevailing current direction; the floating cage position that is influenced by the ocean currents will maintain the mooring rope and chain under tension during most times of operation. The bridle line that connects from the swivel to the cage will be encased in a rigid pipe. Structural information showing the MAS and pen array, along with the tethered tender vessel, is provided in *Appendix B*.

The CopperNet cage design is flexible and self-adjusts to suit the constantly changing wave and current conditions. As a result, the system can operate floating on the ocean surface or submerged within the water column of the ocean. When a storm approaches the area, the operating team uses a valve to flood the floatation system with water, causing the entire cage array to submerge. A buoy remains on the surface, marking the net pen's position and supporting the air hose. When the pen approaches the bottom, the system will maintain the cage several meters above the sea floor. Submerged and protected from the storm above, the system is still able to rotate around the MAS and adjust to the currents. After storm events, facility staff makes the cage system buoyant, causing the system to rise back to the surface or near surface position to resume normal operational conditions. The proposed project cage will have at least one properly functioning global positioning system device to assist in locating the system in the event it is damaged or disconnected from the mooring system.

At the conclusion of the 12-14 month demonstration trial period, the net pen and all disconnected from the mooring system. For a detailed schematic of the pen design see *Appendix B*.

1.7 Environmental Review Process

The EPA is the designated Lead Agency for NEPA compliance for the proposed VE project. According to the 2017 Interagency MOU, [2] agencies with permitting authority will apply the relevant and applicable provisions of NEPA, Endangered Species Act (ESA) Section 7, National Historic Preservation Act (NHPA) Section 106, the Coastal Zone Management Act (CZMA), the Marine Sanctuary Act's (MSA's) Essential Fish Habitat (EFH) provisions, and other applicable laws to their federal actions (NMFS, 2016). Because a particular agency may have more extensive authority and expertise concerning the activities that are subject to these regulations, that agency (or agencies) will generally take the lead on required evaluations or consultations in order to minimize delays and reduce potential duplication and effort (NMFS, 2016). This EA has been developed consistent with the EPA's NEPA implementing regulations and in cooperation with identified cooperating and participating federal agencies.

This EA informs the decision process with regard to issuance of an NPDES permit and Section 10 authorization issued by the EPA and USACE, respectively. In accordance with the MOU, to streamline the NEPA process, EPA requested that the USACE and NMFS participate as cooperating agencies on development of the EA. The EPA and the USACE intend to use the EA to inform decisions related to issuance of required permits and authorizations necessary for the VE project to proceed (note that the applicant must secure permits from both agencies in order to complete the project). Specifically, this EA analyzes a range of potential environmental impacts that could arise from a small-scale open ocean aquaculture system to determine if there is potential for significant impacts to: 1) physical resources; 2) biological resources; and 3) social and economic environment.

1.8 Cooperating Agencies

Consistent with EPA's NEPA regulations (40 CFR Part 6) and pursuant to the interagency MOU, EPA sent a cooperating-agency request to federal agencies involved in the evaluation of the proposed VE project on November 7, 2018. A cooperating agency request was submitted to the USACE and NMFS and participation requests were sent to BOEM, BSEE, USCG and FWS.

[2] On February 6, 2017, the Memorandum of Understanding (MOU) for Permitting Offshore Aquaculture Activities in federal waters of the Gulf of Mexico became effective for seven federal agencies with permitting or authorization responsibilities.

Even though EPA is the lead agency, this EA has been developed to support multiple federal decisions/actions related the proposed project. By developing a single NEPA document, the EPA and USACE are streamlining the NEPA process for this proposed project.

1.9 Documents incorporated by reference

The NEPA implementing regulations direct agencies to develop succinct NEPA documents and incorporate material by reference when appropriate without impeding agency and public review of the action (see 40 CFR Section 1502.21). Therefore, the EPA is incorporating the following documents and references for this EA:

- NOAA Fisheries' 2008 Programmatic Environmental Impact Statement (PEIS), NMFS proposed regional regulations: *Fishery Management Plan to Promote and Manage Marine Aquaculture within the Gulf of Mexico Exclusive Economic Zone*.

- USEPA Region 4's 2016 Environmental Assessment (EA) for *National Pollutant Discharge Elimination System (NPDES) Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Production*

- NOAA Fisheries' 2016 final rule: *the FMP for Regulating Offshore Aquaculture in the Gulf of Mexico*

- 40 CFR Part 6 – *Procedures for Implementing the National Environmental Policy Act and Assessing the Environmental Effects Abroad of EPA Actions.*

- 2016 Interagency Memorandum of Understanding for Permitting Offshore Aquaculture Activities in Federal Waters of the Gulf of Mexico.

2.0 Alternatives

On November 9, 2018, the EPA Region 4 Office received a complete application from the applicant, requesting NPDES permit coverage for discharges from an offshore aquaculture project in federal waters of the Gulf. If approved, the NPDES authorization would allow for the discharge containing pollutants from a point source the proposed offshore aquaculture project into the Gulf.

On November 10, 2018, a DA application was submitted to USACE Jacksonville District for the proposed project pursuant to Section 10 which requires prior authorization for structures and work in, over, under, and affecting navigable waters. This offshore aquaculture project represents one of the first proposed projects of its type in the Gulf.

2.1 Alternatives Considered

The EPA and the USACE are considering two alternatives for the proposed VE project in this EA. Alternatives considered include a No Action Alternative (Alternative 1) and issuance of a NPDES permit and USACE Section 10 permit for the facility (Alternative 2).

2.1.1 Alternative 1--No Action

Under the no-action alternative, the EPA would not issue a NPDES permit, and the USACE would not issue a DA authorization for the proposed the VE project. The effects of the no action alternative are described in Chapter 3, Affected Environment, in which no structures or pens would exist at the site location.

2.1.2 Alternative 2 --Issuance of NPDES Permit and Section 10 Authorization

Under Alternative 2, the EPA would issue a NPDES permit and the USACE would issue a Section 10 DA authorization for the proposed VE project. This Alternative complies with the statutory requirements of the CWA and with the requirements of Section 10 of the Rivers and Harbors Act.

2.2 Alternatives Considered but Eliminated from Detailed Study

As discussed in *Section 1.6 Site Selection*, multiple sites were considered for the proposed project site. An extensive screening process was undertaken by the applicant to evaluate these alternative sites. Sites originally considered but identified in the BES (Appendix A) as non-viable were eliminated from further consideration for not meeting the necessary criteria. For the purposes of NEPA, these alternative sites have been eliminated for consideration by the EPA and USACE and are not carried forward for analysis in this EA.

2.3 Factors Used to Develop and Screen Alternatives

As required by 40 CFR Section 1502.14, the EPA is required to rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for elimination. The EPA is also required to devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their

comparative merits. In addition, the EPA must include reasonable alternatives not within the jurisdiction of the lead agency and include the alternative of no action.

As required by 40 CFR Section 1502.14(a), USACE is required to consider only reasonable alternatives in detail. Reasonable alternatives must be those that are feasible and such feasibility must focus on the accomplishment of the underlying purpose and need (of the applicant) that would be satisfied by the proposed federal action (permit issuance). The alternatives analysis should be thorough enough to use for the public interest review.

As part of the NEPA process, the EPA and USACE must identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference. The EPA must also include appropriate mitigation measures not already included in the proposed action or alternatives.

The EPA and USACE have included both action and no action alternatives in this EA. We provide rationale for alternatives eliminated for additional study in this Chapter. We provide a detailed discussion on the proposed action and the levels of impacts compared to the no action alternative in Chapters 4. Chapter 5 describes cumulative impacts in the context of the proposed action. Chapter 6 provides the agency preference and rationale for the preferred alternative. Protective measures and mitigation measures for the proposed action are described throughout this EA and all supporting documents.

3.0 Affected Environment

3.1 Introduction

This chapter describes the existing environment potentially affected by the proposed action through issuance of required federal permits and authorizations. The current status of each potentially affected resource is discussed below, including: physical resources (Section 3.2), biological resources (Section 3.3), and social and economic environment (Section 3.4). This chapter describes the potentially affected resources prior to the proposed action as a point of comparison for evaluating the consequences or impacts resulting from the proposed action. Resources that are not expected to be impacted (e.g. wetlands) by the proposed action are not discussed in this chapter and therefore are not carried forward for analysis.

The discussion in this section is primarily focused on the proposed location for the VE project, which is in the eastern Gulf (west Florida Shelf) approximately 45 miles southwest of Sarasota, Florida. The applicant will utilize existing land-side facilities such as boat docks and hatcheries for all other aspects that are not analyzed in this section.

The EPA used several sources of information to develop this chapter including but not limited to the *Final Environmental Assessment, National Pollutant Discharge Elimination System (NPDES) Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Production, 2016*. The *Evaluation of the Ocean Discharge Criteria (ODCE)* in *Appendix C, Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility and the NPDES Permit [FL0A00001] Outer Continental Shelf, Gulf of Mexico*, and *Draft Biological Evaluation – Kampachi Farms, LLC – Velella Epsilon, Marine Aquaculture Facility, Outer Continental Shelf Federal Waters of the Gulf of Mexico, March 15, 2019 in Appendix D* provide expanded discussions on the physical and biological environments in the eastern Gulf and the general area of the proposed VE project.

3.2 Physical Resources

Ocean currents on the west coast of Florida were studied for 308 days at the Tampa Ocean Dredged Material Disposal Site (ODMDS), located approximately 18 miles west of Tampa Bay, approximately 27-meters (m) deep, during the 2008-2009 time period (EPA, 2012). Measured currents in this study are consistent with previous studies at the Tampa ODMDS in the 1980s revealing that currents flowed predominately to the south and southeast with mean near bottom current velocities between 5 and 8 cm/sec. Ocean currents were also measured at a NOAA buoy (Station 42022) located along the 50-meter isobath approximately 45 miles north-east of the project location from 2015 to 2018. Currents at this location average 3-5 centimeters per second (cm/sec) higher than at the Tampa ODMDS. Currents at both locations were shown to have a dominant southerly direction in the winter and northerly direction in the summer consistent with circulatory current patterns of the eastern Gulf. Tides can dominate the currents at the Tampa ODMDS, but most often they are dominated by other forces (e.g. surface winds and the Gulf Loop Current). Tidal influence should be less pronounced further offshore.

Offshore habitats in the proposed project area include the water column and the sea floor. The west Florida Shelf extends seaward of Sarasota Bay approximately 200 kilometer (km) to a depth of 200 m and consists mainly of unconsolidated sediments punctuated by low-relief rock outcroppings and several series of high relief ridges. The seafloor on the west Florida Shelf in the proposed project area consists

mainly of course to fine grain sands with scattered limestone outcroppings making up about 18 percent of the seafloor habitat. These limestone outcroppings provide substrata for the attachment of macroalgae, stony corals, octocorals, sponges and associated hard-bottom invertebrate and reef fish communities (EPA, 1994). Unconsolidated (soft) sediments provide habitat for benthic macroinvertebrate communities, consisting of several hundred species and provide an important source of forage for benthic and demersal fishes and shellfish.

3.2.1 Water Quality

Water quality studies have been conducted at the Tampa ODMDS, located approximately 18 miles west of Tampa Bay. During a 2013 EPA Status and Trends study of the Tampa ODMDS the following water quality parameters in the water column were evaluated: conductivity, dissolved oxygen (DO), salinity, temperature, density; and turbidity and conducted laboratory analysis for nutrients, metals, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides and butyltins. Temperatures recorded ranged from 29.77 to 29.98 degrees Centigrade (°C), while salinity ranged from 35.47 to 35.88 parts per thousand (ppt), DO ranged from 5.99 to 6.19 mg/L, and density ranged from 22.14 to 22.99 sigma-T.

The results from chemical analyses of the water samples collected during that study revealed, with the exception of six metals, all other analytes were either not detected at or above the reporting limit or the reported values were flagged as estimates. The six detected metals and their range of values (in micrograms per liter or ug/L) are arsenic (1.0 – 1.09), chromium (0.21 -0.49), copper (0.119 -0.139), lead (0.025), nickel (0.21 – 1.74), and zinc (0.53 – 1.47). All of these values are below levels of concern.

3.2.1.1 Deepwater Horizon Spill

On April 20, 2010, the Deepwater Horizon (DWH) oil drilling rig operating 47 miles southeast of Louisiana in the Mississippi Canyon Block 252 of the Gulf, exploded and sank killing 11 workers and releasing the largest marine oil spill disaster in the U.S. history of marine oil drilling operations. Four million barrels of oil flowed over an 87-day period from the damaged Macondo oil well, before the well was finally capped on July 15, 2010 (EPA, 2017). The oil spill's surface extent exceeded 19,305 square miles and ranged from central Louisiana to the Florida Panhandle (EPA, 2017). The Macondo well is located more than 300 miles North/Northwest of the proposed location of the VE project. The Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS) describes the impacts of DWH and can be found at: http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan/.

3.2.1.2 Red Tide Outbreaks

During the month of October 2017, a bloom of the Florida red tide organism, *Karenia brevis*, broke out in Southwest Florida and extended from Pinellas to northern Collier counties, along approximately 145 miles of coastline at its height. The bloom persisted for over a year and resulted in large scale fish kills, as well as sea turtle and manatee mortality. A state of emergency was declared for seven Florida counties, including Lee, Collier and Charlotte, due to the impact of red tide. *Karenia brevis* is still

occurring in several locations along the coast. Updates on red tide occurrence off the west coast of Florida can be found online.[3]

Nutrient addition to the Gulf is of concern because they contribute to harmful algal blooms (HABs). HABs are on the rise in frequency, duration, and intensity in the Gulf, largely because of human-induced activities (Corcoran, Dornback, Kirkpatrick, & Jochens, 2013). Of the more than 70 HAB species occurring in the Gulf, the best-known is the red tide organism, *Karenia brevis*, which blooms frequently along the west coast of Florida. Macronutrients, micronutrients and vitamins characteristic of fish farms can be growth-promoting factors for phytoplankton. However, a NPDES permit is being issued with conditions to monitor the discharge and protect water quality. The overall pollutant loading of the project should be minimal given the small production levels. Additionally, it is not expected that aquaculture-related pollutants will be measured in the water within 30 meters from the project.

The primary nutrients of interest in relation to open ocean aquaculture are nitrogen and phosphorus; both may cause excess growth of phytoplankton and lead to aesthetic and water quality problems. Generally, in marine waters, phytoplankton growth is either light or nitrogen limited, and phosphorus is not as critical a nutrient as it is in fresh water (Ryther, 1971; Welch, 1980). However, it has been shown that because nutrient fluctuations in the Gulf can be significant due to the large inputs from river systems, both nitrogen limitation and phosphorus limitation can happen concurrently in different locations (Turner & Rabalais, 2013).

3.2.1.3 Pharmaceuticals

Diseases may occur in net-pen systems because water moves freely between net-pens and the open marine environment, allowing the transmission of pathogens between wild and farmed fish (Rust, et al., 2014). Fish diseases occur naturally in the wild, but their effects often go unnoticed because moribund or dead animals quickly become prey for other aquatic animals. Clinical disease occurs only when sufficient numbers of pathogens encounter susceptible fish under environmental conditions that are conducive to disease (Rose, Ellis, & Munro, 1989). Fisheries managers are concerned about the risk of pathogen amplification on farms followed by transmission of pathogens from farmed to wild fish, as well as the introduction of nonnative pathogens and parasites when live fish are moved from region to region. Aquaculture facilities may use a number of measures, including vaccines, probiotics, limiting culture density, high-quality diets, and use of antibiotics, which are effective at preventing and controlling bacterial diseases. Antibiotics are considered a method of last resort and are being replaced by other sound management approaches.

3.2.2 Sediment Quality

The EPA (EPA, 2014) analyzed sediments at the Tampa ODMDS for the following parameters: particle size, total organic carbon, heavy metals, nutrients including total phosphorous (TP), NO_2+NO_3 (Nitrites and nitrates), NH_3 (Ammonia), and Total Kjeldahl Nitrogen (TKN), and extractable organic compounds (e.g., Polyaromatic hydrocarbons or PAHs), pesticides, and Polychlorinated biphenyls or PCBs).

[3] http://www.myfwc.com/RedTideStatus.

All stations were shown to be predominantly sand, ranging from a low of 73.4 % sand to a high of 97.3 % sand. Silt/clay fractions ranged from 0.3 to 26.7 %. Total organic carbon (TOC) results ranged from 0.18 – 0.38 %. The amount of percent solids found for the Tampa ODMDS samples ranged from 68.3 – 82.4 %. The sediment chemistry showed all contaminants, except for metals, to be at or below detection limits. For the thirteen metals analyzed, nine were found to be detectable at one or more sample locations. However, the very low concentration results were not of a significant concern. This sediment data represents the best available information for sediment quality in the region of the proposed action.

3.2.3 Air Quality

In the vicinity of the proposed action, Section 328 of the Clean Air Act Amendments of 1990 (CAA) authorized EPA to establish air-emission control requirements for Outer Continental Shelf (OCS) sources located off Florida's Gulf coast eastward of the 87°30' W longitude. The purpose of these air-control requirements is the attainment and maintenance of federal and state ambient air quality standards and the compliance with the CAA's provisions to prevent significant deterioration of air quality. The EPA Region 4 currently administers the air quality program in the eastern Gulf and the Department of Interior (DOI) is authorized to regulate air emissions in the western Gulf west of 87°30' W longitude (EPA, 2016).

The CAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants (criteria air pollutants) to protect human health and welfare (EPA, 2018a). NAAQS have been designated for these six criteria pollutants: carbon monoxide, ozone, sulfur dioxide, nitrogen dixoide, Particulate Matter (PM) 10, PM2.5, and lead (EPA, 2018b). The EPA is required to designate areas that meet (attainment) or do not meet (nonattainment) these 6 NAAQS to ensure compliance with air quality standards. Additionally, the CAA requires states to develop a general plan (State Implementation Plans) to attain and maintain the NAAQS. For those areas in nonattainment with NAAQS, the states are required to develop a specific plan to achieve attainment for all standards responsible for an area's nonattainment status (EPA, 2018c).

The Gulf has no fixed air quality monitoring stations. Beyond the states' seaward boundaries, the Gulf is listed as unclassified with respect to NAAQS attaintment. Consequently, the only available air quality data relevant to the Gulf is that data collected by the states of Mississippi, Alabama, and Florida's Gulf coastal counties. The comparison of year 2014 to 2005 air quality data for the coastal counties for these three states indicate that the overall air quality has improved. The only non-attainment area along the Gulf's central and eastern coast is the greater Tampa/St Petersburg area within Hillsborough County, Florida (EPA, 2016).

When any new source of air-pollutant emissions meeting a major status is located within an area designated as unclassifiable with respect to the NAAQS, such as the Gulf, the CAA's Prevention of Significant Deterioration (PSD) provisions are triggered. These provisions include: the installation of the "Best Available Control Technology" (BACT); an air quality analysis; an additional impacts analysis; and public involvement (EPA, 2018d).

The purpose of the PSD provisions is to assure that any decision to permit increased air pollution in certain areas is made only after careful evaluation of all the consequences of such a decision and after

adequate procedural opportunities for informed public participation in the decision making process. The focus is to protect the public health and welfare; preserve, protect, and enhance the air quality in Class I areas, such as areas of special national or regional natural, recreational, scenic, or historic value, including national parks, national wilderness areas, national monuments, and national seashores; and insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources. The closest Class I area to the viciniinty of the proposed action is the Breton National Wildlife Refuge (NWR) and Wilderness area offshore southeastern Louisiana near the seaward boundaries of Mississippi and Alabama (EPA, 2016). The Refuge is comprised of a series of barrier islands including Breton Island and the Chandeleur Islands in the Gulf.

3.2.4 Coastal Barrier Beaches

The Gulf is characterized by a broad spectrum of sediments, sediment transport processes, and environments that vary along the spectrum from coastal shores to deep water. Waves, tides, currents, and gravity are the primary transporters of sediments. The coastal sedimentary environments include: beaches, tidal inlets, tidal flats, wetlands, and estuaries that are dominated by sediments originating from land (terrigenous sediments) (Ward, 2017). The proposed action is to be located in approximately 40 m water depth off southwest Florida, generally located approximately 45 miles west, southwest of Longboat Pass-Sarasota Bay, Florida. There are several coastal barrier islands 1-2 miles off shore and in the vicinity of Sarasota to include Siesta Key, Lido Key, Long Boat key, Manasota Key, etc. The islands are highly developed with residential and businesses catering to tourism and recreation.

3.2.5 Noise Environment

The proposed project is located on the west Florida Shelf, approximately 45 miles southwest Sarasota, Florida in federal waters. Ambient noise from wind, waves, and periodic noise from occasional boat and vessel traffic are expected. The facility is not expected to make a significant contribution to ambient noise and to current open operation noise.

3.2.6 Climate

The effect of ongoing human-caused climate change makes the Gulf environment vulnerable to rising ocean temperatures, sea level rise, storm surge, ocean acidification, and significant habitat loss. Cores from corals, ocean sediments, ice records, and other indirect temperature measurements indicate the recent rapid increase of ocean temperature is the greatest that has occurred in at least the past millennium and can only be reproduced by climate models with the inclusion of human-caused sources of heat-trapping gas emissions. While the long-term global sea surface temperature pattern is clear, there is considerable variability in the effects of climate change regionally and locally because oceanographic conditions are not uniform and are strongly influenced by natural climate fluctuations (Doney, et al., 2014).

Certain areas along the Atlantic and Gulf coasts are undergoing relatively rapid sea water inundation and associated landscape changes because of the prevalence of low-lying coastal lands in combination with altered hydrology and land subsidence. The combination of sea level rise and land subsidence is forecast to result in various changes in the distribution and abundance of coastal wetlands and mangroves, which could damage habitat functions for many important fish and shellfish populations (BOEM, 2016). Shellfish populations also are at risk from ocean acidification. Increases in water temperatures will alter

the seasonal growth and geographic range of harmful algae and certain bacteria, such as *Vibrio parahaemolyticus,* which was responsible for human illnesses associated with oysters harvested from the Gulf and northern Europe (Doney, et al., 2014).

3.3 Biological Resources

Biological resources refer to plant and animal communities and associated habitat that they comprise or, that provides important support to critical life stages. This section focuses primarily on the biological resources occurring in the eastern Gulf and in the area of the proposed VE project. The following sub-sections provide a discussion on the biological setting of the eastern Gulf and resources such as birds, reptiles, fish, marine mammals, marine invertebrates, plants, and fish species that may occur in the project area.

The west Florida Shelf extends seaward of Sarasota Bay approximately 200 km to a depth of 200 m and consists mainly of unconsolidated sediments punctuated by low-relief rock outcroppings and several series of high relief ridges. The seafloor on the west Florida Shelf in the immediate vicinity of the proposed project area consists mainly of course to fine grain sands with scattered limestone outcroppings making up about 18% of the seafloor habitat. These limestone outcroppings provide substrata for the attachment of macroalgae, stony corals, octocorals, sponges and associated hard-bottom invertebrate and fish communities (EPA, 1994).

A 2010 survey of the Tampa ODMDS site 18 miles west of Tampa Bay, (70 miles northeast of the proposed VE site) showed that the dominant substrata at the natural bottom sites in the area consisted of sand, live coral, coralline algae, sponge, hydroid, octocorals, rubble, macro algae rock, and turf algae. Macro invertebrate counts at the natural bottom sites were dominated by gastropods, crabs, sea urchins, bivalves and several scelacterian corals including, Blushing star coral (*Stephanocoenia intersepta*), Tube coral (*Cladocora arbuscular*), Smooth star coral (*Solenastrea bournoni*), Thin finger coral (*Porites divaricate*), solitary disc corals such as *Scolymias,* and the Sinuous cactus coral (*Isophyllia sinuosa*).

3.3.1 Fish

The Gulf of Mexico has a diverse ichthyofaunal community consisting of more than 1400 finfish species, over 51 shark species, and at least 49 species of rays and skates. About 900 marine fishes occur off the west Florida coast, occupying all benthic and pelagic habitats, including many managed fish stocks of great commercial and recreational importance. There are also a number of fish species that are protected under the ESA.

Of the ESA-listed fish species, only the Smalltooth sawfish (*Pristis pectinate*), Giant manta ray (*Manta birostris*), and Oceanic whitetip shark (*Carcharhinus longimanus*), may occur in the vicinity of the VE project and the presence of even these species is likely rare. The aquaculture facility proposed sites are more than 250 miles south of the Suwannee River, the southernmost river with a reproducing population of Gulf sturgeon (*Acipenser oxyrinchus desotoi*). There are rare captures of Gulf sturgeon in the bays, estuaries, and nearshore Gulf off Tampa Bay and Charlotte Harbor during the cool winter months, but no reported captures in offshore waters. Nassau grouper (*Epinephelus striatus*), also listed under ESA, are generally absent from the Gulf north and outside of the Florida Keys; this is well documented by the lack of records in Florida Fish and Wildlife Conservation Commission's, Fisheries Independent

Monitoring data as well as various surveys conducted by NOAA Fisheries Southeast Fisheries Science Center (SEFSC). Based on this information, we believe both Gulf sturgeon and Nassau grouper will not be present.

The smalltooth sawfish is a tropical marine and estuarine elasmobranch. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida and are most common off Southwest Florida and the Florida Keys. There are distinct differences in habitat use based on life history stage as the species shifts use through ontogeny. Juvenile smalltooth sawfish less than 220 cm, inhabit the shallow euryhaline waters (i.e., variable salinity) of estuaries and can be found in sheltered bays, dredged canals, along banks and sandbars, and in rivers (NMFS, 2000). As juveniles increase in size, they begin to expand their home ranges (Simpfendorfer, Wiley, & Yeiser, 2010; Simpfendorfer, et al., 2011), eventually moving to more offshore habitats where they likely feed on larger prey as they continue to mature. While adult smalltooth sawfish may also use the estuarine habitats used by juveniles, they are commonly observed in deeper waters along the coasts. Poulakis and Seitz (2004) noted that nearly half of the encounters with adult-sized smalltooth sawfish in Florida Bay and the Florida Keys occurred in depths from 200-400 ft (70-122 m) of water. Similarly, Simpfendorfer and Wiley (2005) reported encounters in deeper waters off the Florida Keys, and observations from both commercial longline fishing vessels and fishery-independent sampling in the Florida Straits report large smalltooth sawfish in depths up to 130 ft (~40 m) (International Sawfish Encounter Database, 2014). Even so, NMFS believes adult smalltooth sawfish use shallow estuarine habitats during parturition (when adult females return to shallow estuaries to pup) because very young juveniles still containing rostral sheaths are captured in these areas. Since very young juveniles have high site fidelities, they are likely birthed nearby or in their nursery habitats. Smalltooth sawfish feed primarily on teleost and elasmobranch fishes at all lifestages even though sawfish move from estuarine to coastal habitats during their ontogeny (Poulakis, et al., 2017).

The Oceanic whitetip shark is a large open ocean highly migratory apex predatory shark found in subtropical waters around the globe. It is usually found offshore in the open ocean, on the OCS or around oceanic islands in deep water greater than 184 m, occurring from the surface to at least 152 m depth. Occasionally, it is found close to land, in waters as shallow as 37 m (~120 ft.), mainly around mid-ocean islands, or in areas where the continental shelf is narrow with access to nearby deep water. Oceanic whitetip sharks feed mainly on teleosts and cephalopods (Backus, Springer, & Arnold, 1956; Bonfil, Clarke, & Nakano, 2008), but studies have also reported that they consume sea birds, marine mammals, other sharks and rays, mollusks, crustaceans, and even garbage (Compagno, 1984; Cortes, 1999). Backus, Springer, and Arnold (1956) recorded various fish species in the stomachs of oceanic whitetip sharks, including blackfin tuna, barracuda, and white marlin. The available evidence also suggests that oceanic whitetip sharks are opportunistic feeders.

On January 22, 2018, NOAA Fisheries published a final rule listing the giant manta ray (*Manta birostris*) as threatened under the ESA effective February 21, 2018 (83 FR 2916). The giant manta ray is the largest living ray, with a wingspan reaching a width of up to 9 m (29.5 ft), and an average size between 4-5 m (15-16.5 ft). The giant manta ray is found worldwide in tropical subtropical, and temperate seas. These slow-growing, migratory animals are circumglobal with fragmented populations. Giant manta rays make seasonal long-distance migrations, aggregate in certain areas and remain resident, or aggregate seasonally (Dewar, et al., 2008; Graham, et al., 2012; Girondot, et al., 2015; Stewart, Hoyos-Padilla, Kumli, & Rubin, 2016). Giant manta rays are seasonal visitors along productive coastlines with regular upwelling, in oceanic island groups, and near offshore pinnacles and seamounts.

The timing of these visits varies by region and seems to correspond with the movement of zooplankton, current circulation and tidal patterns, seasonal upwelling, seawater temperature, and possibly mating behavior .They have also been observed in estuarine waters near oceanic inlets, with use of these waters as potential nursery grounds (Adams & Amesbury, 1998; Milessi & Oddone, 2003; Medeiros, Luiz, & Domit, 2015; Pate). Giant manta rays primarily feed on planktonic organisms such as euphausiids, copepods, mysids, decapod larvae and shrimp, but some studies have noted their consumption of small and moderately sized fishes (Miller & Klimovich, 2017). When feeding, giant manta rays hold their cephalic lobes in an "O" shape and open their mouth wide, which creates a funnel that pushes water and prey through their mouth and over their gill rakers. They use many different types of feeding strategies, such as barrel rolling (doing somersaults repeatedly) and creating feeding chains with other mantas to maximize prey intake.

3.3.2 Invertebrates

Of the more than 15,000 species of animals in the Gulf of Mexico, more than 13,000 are invertebrates. Like fishes, marine invertebrates are distributed throughout the Gulf and they occupy all marine habitats. Some species of crabs, shrimps and lobster, etc., make up important managed fishery stocks and several invertebrate species are protected under ESA.

Marine invertebrates currently protected under ESA include a number of species of stony coral (i.e., Elkhorn (*Acropora palmata*), Staghorn (*Acropora cervicornis*), Pillar (*Dendrogyra cylindrus*), Rough cactus coral (*Mycetophyllia ferox*), Lobed star (*Orbicella annularis*), Mountainous star (*Orbicella faveolata*), and Boulder star (*Montastrea annularis*). The listed coral species do not occur in or near the VE project. Of the seven ESA-listed coral species in the Gulf, four (Elkhorn, Lobed star, Mountainous star, and Boulder star) are known to occur in the Flower Banks National Marine Sanctuary, located 70 to 115 miles off the coast of Texas and Louisiana and all seven are known to occur near the Dry Tortugas, a small group of islands located in the Gulf approximately 67 miles west of Key West, Florida.

3.3.3 Marine Mammals

There are 22 marine mammal species protected by the MMPA occurring in the Gulf, a manatee (under Fish and Wildlife Service jurisdiction) and 21 cetacean species (dolphins and whales; all under NOAA Fisheries' jurisdiction). Two of the marine mammals, Sperm whales (*Physeter macrocephalus*) and manatees (genus *Trichechus*), have been protected under the ESA for many years and an unnamed subspecies, the Gulf Bryde's whale (*Balaenoptera edeni*), was just listed as endangered under the ESA (81 FR 88639).

The manatee species in the Gulf, Western Indian Manatee (*Trichechus manatus*) does not travel into offshore waters of the VE project area. In contrast, most of the Gulf cetacean species reside in the oceanic habitat (greater than or equal to 200 m). However, the Atlantic spotted dolphin (*Stenella frontalis*) is found in waters over the continental shelf (10 m-200 m), and the Common bottlenose dolphin (*Tursiops truncatus truncatus*) (hereafter referred to as Bottlenose dolphin) is found throughout the Gulf, including within bays, sounds, and estuaries; coastal waters over the continental shelf; and in deeper oceanic waters. Consequently, Bottlenose dolphins and Atlantic spotted dolphins are the most likely marine mammal species that overlap with the facility's proposed sites. There are other marine

mammal species that may overlap with the facility's proposed site, but these marine mammals are not known to use this habitat regularly or are likely extralimital or occasional migrants.

Bottlenose dolphins in the Gulf can be separated into demographically independent populations called stocks. Bottlenose dolphins are currently managed by NOAA Fisheries as 36 distinct stocks within the Gulf. These include 31 bay, sound and estuary stocks, three coastal stocks, one continental shelf stock, and one oceanic stock (Hayes, Josephson, Maze-Foley, & Rosel, 2017). Marine Mammal Stock Assessment Reports and additional information on these species in the Gulf are available on the NOAA Fisheries Office of Protected Species website: http://www.nmfs.noaa.gov/pr/sspecies/.

The Bottlenose dolphin stock that overlaps with this action is the Northern Gulf continental shelf stock. The best abundance estimate for this stock is 51,192 with a resulting potential biological removal[4] of 469 (Waring, Josephson, Maze-Foley, & Rosel, 2016). This stock of dolphins inhabits waters from 20 m to 200 m deep from U.S.-Mexican border to the Florida Keys (Waring, Josephson, Maze-Foley, & Rosel, 2016). Threats to this stock include fisheries entanglements (e.g., shark bottom hook and line and bottom longline, snapper-grouper and other reef fish bottom longline and hook and line, and trawl fisheries for Butterfish (*Peprilus triacanthus*) and shrimp) that can result in serious injury or death (Waring, Josephson, Maze-Foley, & Rosel, 2016).

The Atlantic spotted dolphin occurs primarily from continental shelf waters 10 m to 200 m deep to slope waters (Fulling et al., 2003; Mullin and Fulling, 2004; Maze-Foley and Mullin, 2006). The most recent best abundance estimate for this stock is 37,611. However, the potential biological removal is currently unknown given the lack of more current population surveys (Waring, Josephson, Maze-Foley, & Rosel, 2016). There tends to be a concentration of these animals over the Florida Shelf in the eastern Gulf and stretched westward to the Florida panhandle (Waring, Josephson, Maze-Foley, & Rosel, 2016). It has been suggested that this species may move inshore seasonally during the spring, but data supporting this proposition are limited (Caldwell & Caldwell, 1966; Fritts, et al., 1983). Threats to this stock include fisheries entanglements (e.g., pelagic longline and shrimp trawl gear) that can result in serious injury or death (Waring, Josephson, Maze-Foley, & Rosel, 2016).

3.3.4 Sea Turtles

Green sea turtles (*Chelonia mydas*) North Atlantic and South Atlantic district population segments (DPSs), Hawksbill (*Eretmochelys imbricate*), Kemp's ridley (*Lepidochelys kempii*), Leatherback (*Dermochelys coriacea*), and Loggerhead (*Caretta Caretta*-Northwest Atlantic DPS) sea turtles are all highly migratory and travel widely throughout the Gulf. Several volumes exist that cover the biology and ecology of these species (Lutz & Musick, 1997; Lutz, Musick, & Wyneken, 2003; Wyneken, Lohmann, & Musick, 2013). Sea turtles are primarily diurnal and feed and rest intermittently during a typical day. Sea turtles can spend their nights sleeping at the surface while in deep water or on the bottom wedged under rocks in nearshore waters. Many divers have seen green turtles sleeping under

[4] The potential biological removal (PBR) level is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The PBR level is the product of the following factors—

- The minimum population estimate of the stock;
- One-half the maximum theoretical or estimated net productivity rate of the stock at a small population size; and
- A recovery factor of between 0.1 and 1.0.

ledges in reefs and rocks. Hatchlings typically sleep floating on the surface, and they usually have their front flippers folded back over the top of their backs.

Green sea turtle hatchlings occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr A. , 1987; Walker, 1994). Pelagic stage Green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick, 1976; Hughes, 1974). At approximately 20 cm to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal, 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also known to consume jellyfish, Sea salps, and sponges (Bjorndal, 1980; Bjorndal, 1997; Paredes, 1969; Mortimer, 1981; Mortimer, 1982). During the day, green turtles occupy shallow flats and seagrass meadows. In the evening, they return to their sleeping quarters of rock ledges, oyster bars and coral reefs. The diving abilities of all sea turtle species vary by their life stages. The maximum diving range of Green sea turtles is estimated at 110m (360 ft.) (Frick, 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker, 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes, with most dives lasting from nine to 23 minutes (Walker, 1994). NOAA Fisheries and FWS removed the range-wide and breeding population ESA listings of the Green sea turtle and listed eight DPSs as threatened and three DPSs as endangered, effective May 6, 2016. Two of the Green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf and are listed as threatened.

The Hawksbill sea turtle's pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan A. , 1988; Meylan & Donnelly, 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage Hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam & Diez, 1998). The Hawksbill's diet is highly specialized and consists primarily of sponges (Meylan A. , 1988). Gravid (pregnant) females have been noted ingesting coralline substrate (Meylan A. , 1984) and calcareous algae (Anderes Alvarez & Uchida, 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are unknown, but the maximum length of dives is estimated at 73.5 minutes, more routinely dives last about 56 minutes (Hughes, 1974).

Kemp's ridley sea turtle hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr A. , 1987; Ogren, 1989). After the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50m) benthic foraging habitat over unconsolidated substrates (Marquez, 1994). They have also been observed transiting long distances between foraging habitats (Ogren, 1989). Adult and sub-adult Kemp's ridleys primarily occupy nearshore habitats that contain muddy or sandy bottoms where prey can be found. Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver, 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or discarded bait (Shaver, 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma, 1985; Byles, 1988). Their maximum diving range is unknown. Depending on the life stage, a Kemp's ridley may be able to stay submerged anywhere from 167 minutes to 300 minutes,

though dives of 12.7 minutes to 16.7 minutes are much more common (Soma, 1985; Mendonca & Pritchard, 1986; Byles, 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma, 1985; Byles, 1988).

Leatherback sea turtles are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. They will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, Leatherbacks' diets do not shift during their life cycles. Because Leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal, 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1,000 m (Eckert, Eckert, Ponganis, & Kooyman, 1989) but more frequently dive to depths of 50 m to 84 m (Eckert, Nellis, Eckert, & Kooyman, 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora, Spotila, Keinath, & Shoop, 1984; Eckert, Nellis, Eckert, & Kooyman, 1986; Eckert, Eckert, Ponganis, & Kooyman, 1989; Keinath & Musick, 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora, Spotila, Keinath, & Shoop, 1984).

Loggerhead sea turtle hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes, 1974; Carr A. , 1987; Walker, 1994; Bolten & Balazs, 1995). The pelagic stage of these sea turtles is known to eat a wide range of things including Sea salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma, 1972). Stranding records indicate that when pelagic immature Loggerheads reach 40 cm to 60 cm straight-line carapace length, they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell W. , 2002). Here they forage over hard- and soft-bottom habitats (Carr A. , 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke, Morreale, & Rhodin, 1993). Estimates of the maximum diving depths of Loggerheads range from 211 m to 233 m (692-764 ft.) (Limpus & Nichols, 1988; Thayer, Bjorndal, Ogden, Williams, & Zieman, 1984). The lengths of Loggerhead dives are frequently between 17 and 30 minutes (Thayer, Bjorndal, Ogden, Williams, & Zieman, 1984; Limpus & Nichols, 1988; Limpus & Nichols, 1994; Lanyon, Limpus, & Marsh, 1989) and they may spend anywhere from 80% to 94% of their time submerged (Limpus & Nichols, 1994; Lanyon, Limpus, & Marsh, 1989).

Of the five sea turtles species, loggerheads are the most abundant on the west Florida shelf. The west Florida shelf hard-bottom and live-bottom habitats provide long-term residence and foraging habitats for juvenile and adult loggerheads. The West Florida Shelf provides residence areas for post-nesting loggerheads from four of the five loggerhead recovery units identified by the NOAA Fisheries and the USFWS in their recovery plan for the northwest Atlantic loggerhead population (NOAA and FWS, 2008). Those four recovery units are peninsular Florida (Girard, Tucker, & Calmettes, 2009; Phillips, 2011; Ceriani, Roth, Evans, Weishampel, & Ehrhart, 2012; Foley, et al., 2013), the Dry Tortugas (Hart, et al., 2012), the northern Gulf of Mexico (Hart, et al., 2012; Foley, et al., 2013), and the northern Atlantic (Mansfield, 2006; Griffin, et al., 2013).

3.3.5 Birds

The marine and coastal birds that occur in the Gulf region for at least some portion of their life cycle are generally classified as seabirds, shorebirds, wetland birds, waterfowl, passerines, and raptors (EPA, 2016).

Seabirds include gulls, terns, loons, frigate birds, pelicans, tropicbirds, cormorants, gannets, boobies, storm-petrels, and shearwaters. They spend a large portion of their lives on or over seawater and may be found both in offshore and coastal waters of the Gulf. They feed on fish and invertebrates; their temporal occurrence varies greatly. Some seabirds, e.g., boobies, petrels, and shearwaters, only occur in open ocean habitats, including deeper waters of the continental slope and basin. Most seabird species of the Gulf are found in the continental shelf and adjacent coastal and inshore habitats.

Shorebirds include plovers, oystercatchers, stilts, avocets, and sandpiper. Shorebirds typically are small wading birds that feed on invertebrates in shallow waters and along beaches, mudflats, and sand bars. Shorebirds are generally restricted to coastline margins except when migrating. Shorebirds are generally solitary or occur in small- to moderate-sized flocks, although large aggregations of several species can occur during migration.

There are 14 federally-listed avian species identified as threatened or endangered, previously delisted, or as candidate species in the eastern Gulf of Mexico. Three species are listed as threatened; eight species are listed as endangered; and three species are delisted. Of those species, only two listed species are considered in this EA because their behavior and range could expose them to activities covered under the proposed action: Piping plover (*Charadrius melodus*) and Red knot (*Calidris canutus*). See the *Biological Evaluation - Appendix D* for more information. There are several other listed species whose range includes inshore and coastal margin waters that are very unlikely to be exposed to the activities covered under the proposed VE permit.

The Piping plover is a shorebird that inhabits coastal sandy beaches and mudflats. Critical habitat rules have been published for Piping plover, including designations for coastal wintering areas in Florida. The Piping plover is considered a state species of conservation concern in all Gulf coast states (BOEM, 2012a).

The Red knot, listed as threatened in 2014, is a highly migratory species travels between nesting habitats in mid- and high-Arctic latitudes and southern non-breeding habitats in South America and the U.S. Atlantic and Gulf of Mexico coasts (BOEM, 2012b). Red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks for bivalves, gastropods, and crustaceans (FWS, 2013). Wintering Red knots are found primarily in Florida and is considered a State Species of Conservation Concern.

3.3.6 Essential Fish Habitat

There are seven Gulf Fishery Management Plans (FMPs), covering a number of representative finfish and shellfish species, which result in most of the landings from the Gulf. The FMPs or amendments to the plans, provide the basis for management of fishery resources in the Gulf of Mexico by regulating the

amount of fish that are harvested and are enforced by the U.S. Coast Guard, enforcement agents from the NMFS, and the Gulf states.

Representative fish species from all FMPs occur in the area around the proposed VE site. In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. Habitat types and life history stages can be found in more detail in (Gulf of Mexico Fishery Management Council, 2004). Generally, both eggs and larval stages are planktonic with larvae feeding on zooplankton and phytoplankton. Exceptions to these generalizations include the Gray triggerfish (*Balistes capriscus*) that lay their eggs in depressions in the sandy bottom, and Gray snapper (*Lutjanus griseus*) whose larvae are found around submerged aquatic vegetation. Juvenile and adult reef fish are typically demersal, and are usually associated with benthic features which offer some relief (i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings).

The 2010 EPA Tampa ODMDS survey identified 29 species of demersal fishes associated with the high relief habitat created by the dredged material spoil mound, with 14 species on nearby natural low-relief hard bottom habitat. Abundances of fishes on natural low-relief hard bottom in the area were also significantly smaller than on the spoil mound (EPA, 2011). Coastal pelagic fishes that are common to the area include some commercially important groups of fishes including sharks, anchovies, herring, mackerel, tuna, mullet, bluefish and cobia. Oceanic pelagic species occur at or seaward of the shelf edge include many larger species such as sharks, tuna, bill fishes, dolphin and wahoo.

More extensive descriptions of fish communities in the eastern Gulf, and their associated habitat, can be found in the *ODCE for Kampachi Farms, – Velella Epsilon Net Pen Fish Culture Facility, Appendix C*, the *Final Environmental Assessment, National Pollutant Discharge Elimination System (NPDES) Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Production, 2016*, and the NOAA Fisheries' 2008 Programmatic Environmental Impact Statement (PEIS), NMFS proposed regional regulations: *Fishery Management Plan to Promote and Manage Marine Aquaculture within the Gulf of Mexico Exclusive Economic Zone*.

3.3.7 Deepwater Benthic Communities

Depending on the criteria used, deepwater and related deepwater biological communities in the Gulf are generally defined as occurring in a range of depths from 200 -500 m (i.e., 656-1500 ft.). The proposed VE site is located along the 40-45 m (120-135 ft.) depth range. Because depths equal to 200 m occur approximately 130 miles off Sarasota, FL, deepwater benthic communities are not found near the proposed site.

3.3.8 Live Bottoms

The seafloor on the west Florida shelf in the immediate vicinity of the proposed project area consists mainly of course to fine grain sands with scattered limestone outcroppings making up about 18% of the seafloor habitat. These limestone outcroppings provide substrata for the attachment of macroalgae, stony corals, octocorals, sponges and associated hard-bottom invertebrate and fish communities (EPA, 1994) . A 2010 survey of the Tampa ODMDS site 18 miles west of Tampa Bay, (70 miles northeast of the proposed VE site) showed that the dominant substrata at the natural bottom sites in the area consisted of

sand, live coral, coralline algae, sponge, hydroid, octocorals, rubble, macro algae rock, and turf algae. Macro invertebrate counts at the natural bottom sites were dominated by gastropods, crabs, sea urchins, bivalves and several scleractinian corals identified in *Section 3.3 Biological Resources*.

3.3.9 Seagrasses

The west Florida coast, in both Florida State waters and adjacent federal waters, include the two largest contiguous seagrass beds in the continental United States: the Florida Keys and the Florida Big Bend regions. Florida seagrasses include Turtle grass (*Thalassia testudinum*), Shoal grass (*Halodule wrightii*), and Manatee grass (*Syringodium filiforme*), the most abundant species in estuarine and nearshore waters. Star grass (*Halophila engelmanii*) is locally abundant in turbid estuarine environments, and Paddle grass (*Halophila decipiens*), covers large areas of the west Florida shelf at depths from 9 m to more than 30 m (30 to over 100 ft.). Wigeon grass (*Ruppia maritima*) is also widely distributed in Florida estuaries.

Sargent, Leary, Crewz, and Kruer (1995) estimated that Florida State waters contained approximately 2,660,000 acres of seagrass, of which 55% (1,451,900 acres) occur in the Florida Keys and Florida Bay. An additional 826,800 acres (31% of statewide total seagrass area) occurred in the Big Bend region. The remaining seagrass area, 381,200 acres, was distributed in estuaries and lagoons throughout the State. If seagrasses in adjacent federal waters, including deepwater *Halophila* beds, are included, seagrass area in State and federal waters totals more than 3 million acres.

Seagrasses are very sensitive to water column transparency, their depth, distribution, and survival are primarily determined by water clarity. In areas with extremely clear water (the offshore areas of Big Bend and the Florida Keys, seagrasses grow to depths greater than 20 m (65 ft.). The only seagrass species that may be found of the shelf offshore Sarasota Bay is Paddle grass (*Halophila decipiens*), which can occur at depths over 30m (90 ft.) in very clear water (Handley, Altsman, & DeMay, 2007).

3.4 Social and Economic Environment

The following sections provide discussion on the status of U.S. seafood production and consumption, commercial aquaculture, commercial landings of Almaco jack, and environmental justice.

3.4.1 U.S. Seafood Consumption and Production

The U.S. is a net importer of seafood. In 2017, the U.S. imported edible seafood products valued at $21.5 billion and exported $5.7 billion (NMFS, 2018a). That is a seafood trade deficit of $15.8 billion. U.S. commercial landings (wild-catch) cannot increase to eliminate that deficit without becoming unsustainable. However, aquaculture production can increase and become a potentially sustainable resource.

3.4.2 Commercial Marine Aquaculture Production

The U.S. ranks sixteenth in world aquaculture production (NMFS, 2018a). That production rank includes both freshwater and marine aquaculture. Within the U.S, the Gulf is a major aquaculture

producer (NMFS, 2015a), and marine aquaculture production has been increasing.[5] However, current freshwater aquaculture production far exceeds marine aquaculture.

Gulf marine aquaculture primarily produces oysters, hard clams, and live rock species. Florida ranks toward the top in the U.S. for hard clam production and most of its production occurs in Cedar Key. Florida is also the largest live rock producer that occurs in Monroe County. Economic and demographic characteristics of these and other Gulf areas can be found in NOAA Fisheries community profiles. The full-length community profiles, last updated in 2002 to 2005, have in-depth information regarding the historic, demographic, cultural, and economic context for understanding a community's involvement in fishing.[6]

3.4.3 Commercial Landings of Almaco Jack

Almaco jack is part of the Gulf Reef Fish Fishery and it along with Banded rudderfish (*Seriola zonata*) and Lesser amberjack (*Seriola fasciata*) make up the 'Jacks Complex'. The Jacks Complex has a combined commercial and recreational annual catch limit (ACL), and with the exception of 2013, annual landings have been less than the ACL. Commercial landings of the complex are considerably lower than recreational landings. More information about the Jacks Complex and the Reef Fish Fishery can be found on the NMFS Southeast Regional Office's Gulf of Mexico Reef Fish webpage and is incorporated by reference.

Dockside (ex-vessel) revenue from Almaco jack landings accounted for an average of 0.3% of the total dockside revenue for commercial fishing vessels that harvested the species from 2012 to 2016. The very low percentage is expected because Almaco jack is not a commercially targeted species. Instead, it is incidentally harvested by commercial vessels that target pelagic species. Almaco jack has a relatively low dockside price because it is commonly characterized as a 'trash fish'. For example, when compared with other species (e.g., Banded rudderfish, Vermilion snapper (*Rhomboplites aurorubens*) and Hogfish (*Lachnolaimus maximus*) and excluding King mackerel, (*Scomberomorus cavalla*) the reef fish fishery, the dockside price of Almaco jack ranks towards the bottom. Nonetheless, commercial landings of wild-caught Almaco jack generate economic benefits to the nation in the form of jobs and income, sales, and value-added impacts. Average annual landings (59,633 lbs. gw with a value of $85,658 in 2016) generates 11 full- and part-time jobs, $312 thousand in income impacts and other benefits (estimates produced by NMFS SERO using model produced and applied in Fisheries Economics of the United States, 2016).[7] For more information about commercial landings within the Gulf, see reference at NMFS, 2018a. There is presently no commercial aquaculture of Almaco jack in the Gulf. Nevertheless, it is traditionally harvested.

[5] More information about Gulf aquaculture at the regional and state levels can be found in the USDA Census of Aquaculture and is incorporated by reference (https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Census_of_Aquaculture/).

[6] Community profiles for fishing communities in the Gulf can be found at http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/ and is incorporated by reference.

[7] More information about the dealers and commercial fishing in Florida at the community level can be found within the community profiles and is incorporated by reference (http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/)

3.4.4 Commercial Fishing

Commercially important species groups in the GOM include oceanic pelagic (epipelagic) fishes, reef (hard bottom) fishes, coastal pelagic species, and estuarine-dependent species. Invertebrates such as shrimp, blue crab, spiny lobster, and stone crab also contributed significantly to the value of commercial landings. Other finfish species that contributed substantially to the overall commercial value of the GOM fisheries included red grouper, red snapper, and yellowfin tuna.

The commercial fishing industry is an important component of the economy of the Gulf coast of Florida. Table 5 show commercial landings and ex-vessel values for finfish and shellfish landing for west Florida that are compiled annually by NMFS. In 2014 and 2015, commercial landings of all fisheries in west Florida totaled in excess of 63 million and 71 million pounds, respectively and was valued at $171 million and $190 million (NMFS Office of Science and Technology, 2016). The Gulf shellfishery dominated, with only 22% of the total landings, but accounting for 78% of the value; shrimp represented nearly 70% of the shellfish catch and value.

Important commercial finfish and shellfish include red grouper, Atlantic herring, king mackerel, striped mullet, red snapper, yellowtail snapper. blue crab, stone crab (claws), spiny lobster, oysters, and brown and pink shrimp.

Table 5. Annual Commercial Landings for West Florida, 2014 and 2015

Metrics	2014	2015
Thousand Pounds	63,657	71,633
Metric Tons	28,875	32,493
Thousand Dollars	171,565	190,586

Source: NMFS, 2016

3.4.5 Recreational Marine Fishing

In 2017, the U.S. recreational marine fishers took an estimated 202 million fishing trips and harvested an estimated 397 million fish weighing 447 million pounds. Approximately 36% of those trips were made in the Gulf (NMFS, 2018a). Recreational fishing activity can affect a regional economy in a number of ways. When anglers participate in fishing activities, they support sales and employment in recreational fishing and other types of businesses. Anglers buy fishing equipment from bait and tackle shops, rent or buy boats, or pay to have others take them on charter boats to fish. They may also pay for food and drink at local restaurants, purchase gas for their boat, and stay in hotels for overnight fishing trips (NMFS, 2018b).

The majority of Gulf trips are in West Florida. In 2015, for example, approximately 64% of the Gulf's recreational fishing trips were in West Florida (NMFS Office of Science and Technology, 2016) The 13,219 angler trips in West Florida generated 60,179 jobs, approximately $2.6 billion in income and other beneficial impacts (NMFS, 2018b).

The most commonly caught non-bait species (numbers of fish) in the eastern Gulf in 2015 were Spotted seatrout (*Cynoscion nebulosus*), Gray snapper, Red drum (*Sciaenops ocellatus*), Blue runner or

Bluestripe jack (*Caranx crysos*), and Sand seatrout (*Cynoscion arenarius*). The largest harvests by weight were for Spotted seatrout, Red drum, Red snapper (*Lutjanus campechanus*), King mackerel, Sheepshead (*Archosargus probatocephalus*), and Dolphinfish (*Coryphaena hippurus*) (NMFS Office of Science and Technology, 2016). The species most commonly caught on Gulf trips that fished primarily in federally-managed waters were Red snapper, Red grouper (*Epinephelus morio*), White grunt (*Haemulon plumierii*), Dolphinfish, and Yellowtail snapper (Ocyurus chrysurus). About 33 % of the total Gulf catch came on trips that fished primarily in the state territorial seas.

3.4.6 Human Health/Public Health

Aquaculture's contribution to global seafood production continues to rise. With this rise in aquaculture production, human health/public health issues associated with aquaculture should be considered. Human health/public health concerns that can arise from aquaculture production include the increase in use of formulated food, use of antibiotics, use of antifungals, and use of agrochemicals. These aquaculture practices can potentially lead to elevated levels of antibiotic residuals, antibiotic-resistant bacteria, persistent organic pollutants, metals, parasites, and viruses in aquaculture finfish. People working in and around aquaculture facilities, populations living near these operations, and consumers may be at potential risk of exposure to these containments (Sapkota, et al., 2008).

3.4.7 Environmental Justice

On February 11, 1994, the President issued Executive Order 12898 (E.O. 12898), "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*." E.O. 12898 provides that "*each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations*." E.O. 12898 also provides for agencies to collect, maintain, and analyze information on patterns of subsistence consumption of fish, vegetation, or wildlife.

Where an agency action may affect fish, vegetation, or wildlife, the agency should consider the potential adverse effects on subsistence patterns of consumption and indicate the potential for disproportionately high and adverse human health or environmental effects on low-income populations, and minority populations. The proposed project is physically located on the west Florida shelf, approximately 45 miles west, southwest of Longboat Pass-Sarasota Bay, Florida in federal waters, which is not near any minorities or low-income populations. However, harvested farmed fish would be brought to port where wild fish are landed by potentially subsistence fishermen.

4.0 Environmental Consequences

4.1 Introduction

This chapter describes the potential environmental impacts associated with the proposed actions as well as the issuance of required federal authorizations necessary to operate the VE project. The anticipated impacts on resources as a result of the VE project are discussed in the following sections.

Concerns related to the environment regarding aquaculture operations include water quality (waste and pharmaceutical applications), genetic impacts to wild fish from cultured fish escapes (e.g., loss of fitness to wild populations if wild and cultured fish interbreed), spread of disease from cultured to wild fish, entanglement of protected species in aquaculture gear, use of bait fish as a feed source, risk of loss of equipment and damage to the marine environment during severe storm events (e.g., tropical storms, hurricanes), privatization of a public resource (federal waters) for profit, loss of ocean space where aquaculture operations are sited, and socio-economic impacts on commercial or recreational fisheries.

Generally, open ocean aquaculture may have effects on water and sediment quality and the plant and animal communities living in the water column and those in close association with, on, or in the sediments. The two major factors which determine the geographic distribution and severity of impacts of open ocean aquaculture on the water column, seafloor sediments and benthic communities are farm operations management, and farm siting. Sound farm operating practices tend to reduce waste loading by employing efficient feeding methods and by use of dry, slow sinking, more easily digested feed types. Good management practices can also limit impacts due to escapes, spread of diseases, and entanglements etc. Proper farm siting can minimize water column and benthic impacts by maximizing over bottom depths and current flow through cages, and through avoidance of more sensitive biological communities. Optimal siting can also reduce potential marine resource use conflicts.

A more extensive discussion of the potential impacts on physical and biological resources associated with the proposed action are provided in *Appendix C*, *Evaluation of the Ocean Discharge Criteria, Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility and the NPDES Permit [FL0A00001] Outer Continental Shelf, Gulf of Mexico* and *Appendix D*, *Draft Biological Evaluation – Kampachi Farms, LLC - Velella Epsilon, Marine Aquaculture Facility, Outer Continental Shelf Federal Waters of the Gulf of Mexico, March 15, 2019*.

4.2 Physical Resources

Offshore aquaculture operations can affect physical resources in several ways. Particulates from fish cages add to water column turbidity and reduced clarity. Solid wastes can alter the physical environment and chemistry of benthic sediments. In cases of extreme loading, solid wastes can result in burial of benthic habitats beneath cages. The placement of physical structures on the seafloor, i.e., anchors and anchor lines, and in the water column, cages, may result in damage to seafloor habitat and entanglement and collision impacts to motile marine animals.

Alternative 1 - No Action. The No Action alternative would result in no effect on physical resources (water column and seafloor) because an aquaculture facility would not be able to discharge any

operational wastes without an NPDES permit, and without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, the issuance of an NPDES and Section 10 permits, will likely have minimal impacts to physical resources in the vicinity of the proposed facility. The siting analysis conducted during the site selection process chose an area consisting of unconsolidated sediments coupled with sufficient depth and current flow parameters that should result in broad dispersion of solid wastes. Positioning away from potential live bottom habitat will mitigate physical benthic impacts from anchors and mooring lines. The cage is designed to swivel around the center of a suspended 3-point mooring, further reducing anchor chain sweep. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is expected to result in small daily loading rates per meter squared (m^2) downstream of the cage. Solid wastes settling on the seafloor will likely undergo resuspension and transport and additional dispersion from the area resulting in minimal solids accumulation.

4.2.1 Water Quality

The water quality around offshore aquaculture operations is mainly affected by the release of dissolved and particulate inorganic and organic nutrients. Water column effects around offshore aquaculture operations include a decrease in dissolved oxygen and increases in biological oxygen demand, and nutrients (Phosphorus, total Carbon and organic and inorganic Nitrogen), increased turbidity and potential for ammonia toxicity. Degradation of water quality parameters is greatest within the fish culture structures and improves rapidly with increasing distance from cages. Recent studies have documented only limited water column impacts due to rapid dispersal (Holmer, 2010). The health of the fish stocks is a self-limiting control on water column pollution. A more extensive discussion of water quality impacts from offshore aquaculture operations can be found in the *ODCE for Kampachi Farms, – Velella Epsilon Net Pen Fish Culture Facility*, *Appendix C*.

Alternative 1 - No Action. The No Action alternative would result in no change to the quality of the water column because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of an NPDES and Section 10 permits will likely have minimal impacts to water quality in the vicinity of the proposed facility due to the small fish biomass, 74,800 lbs. produced during a 280-day fish production cycle in the single cage facility and current flows measured in the vicinity of the selected site. It is estimated (CASS Tech Report, Appendix F) that a total of 2,743 kg of ammonia nitrogen would be produced during the production cycle. The CASS report suggested that daily ammonia production at levels twice as high as estimated will be undetectable within 30 meters of the cage at typical current flows regimes in the vicinity of the proposed site. The EPA's calculations provided in the ODCE for this project, *Appendix C*, estimated that the flow-averaged ammonia concentration at an ammonia production of 9.8 kilograms per day (kg/day) loading rate is approximately

= 0.0072 milligrams per liter (mg/l), significantly below the USEPA's published ammonia aquatic life criteria values for saltwater organisms.[8]

4.2.1.1 Pharmaceuticals

There is some concern that use of antibiotics in offshore aquaculture operations could lead to an increase in antibiotic resistance among bacteria in the facility effluent. An extensive discussion of impacts resulting from pharmaceutical application at offshore aquaculture operations can be found in the ODCE for this project, *Appendix C*.

The applicant has indicated that FDA-approved antibiotics will not likely be used during the proposed project due to the strong currents expected at the proposed action area and the low fish culture density. In the unlikely event that therapeutants are used, administration of drugs will be performed under the control of a licensed veterinarian. In addition, the NPDES permit will require that the use of any medicinal products including therapeutics, antibiotics, and other treatments are to be reported to the EPA. The report will include types and amounts of medicinal product used and the period of time it was used.[9]

Alternative 1 - No Action. The No Action alternative would result in no use of pharmaceutical agents because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely result in minimal use of pharmaceutical agents only in the event of disease, and, therefore, have minimal impacts to sediment quality in the vicinity of the proposed facility. Also, due to the small fish biomass, 74,800 lbs. produced during a 280-day fish production cycle in the single cage facility, the amounts of pharmaceutical agents needed will be small, and current flows measured in the vicinity of the selected site should result in broad dispersal of any pharmaceutical agents onto the seafloor.

4.2.2 Sediment Quality

The two most significant sources of impacts to sediment quality from offshore aquaculture operations are total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. Numerous studies have shown that organic enrichment of the seabed is the most widely encountered environmental effect of culturing fish in cages (Karakassis, Tsapakis, Hatziyanni, Papadopoulou, & Plaiti, 2000; Price & Morris Jr., 2013; Karakassis, Tsapakis, Smith, & Rumohr, 2002). The spatial patterns of organic enrichment from offshore aquaculture operations varies with physical conditions at the sites and farm specifics and has been detected at distances from meters to several

[8] EPAS recommended saltwater aquatic life criteria is available at: www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table.

[9] The applicant noted in the NPDES permit application that only FDA-approved therapeutants for aquaculture would be used. The applicant is not expected to use any drugs; however, in the unlikely circumstance that therapeutant treatment is needed, three drugs were provided to the EPA as potential candidates (hydrogen peroxide, oxytetracycline dihydrate, and florfenicol).

hundred meters from the perimeter of the cage array (Mangion, Borg, & Schembri, 2014). Studies of offshore aquaculture operations in the Mediterranean showed that the severe effects of organic inputs from fish farming on benthic macrofauna are limited to up to 25 m from the edge of the cages (Lampadariou, Karakassis, & Pearson, 2005) although the influence of carbon and nitrogen from farm effluents in sea floor can be detected in a wide area about 1,000 m from the cages (Sara, Scilipoti, Mazzola, & Modica, 2004). The impacts on the seabed beneath the cages were found to range from very significant to relatively negligible depending on sediment type and the local water currents, with silty sediments having a higher potential for degradation. The ODCE anticipates impacts from the VE facility will likely be limited to 300 m—500 m from the perimeter of the cage (Appendix C). Moreover, model results for this project predict that there are minimal to no risks to water quality or benthic ecology funtions within the area of operation, *CASS Technical Report Appendix F*. A more in-depth discussion of potential impacts to sediment quality can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility*, *Appendix C*.

Alternative 1 - No Action. The No Action alternative would result in no effect on sediment quality around the site because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to sediment quality in the vicinity of the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in broad dispersion of solid wastes. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) is expected to result in small daily loading rates per meter squared downstream of the cage. Solid wastes settling on the seafloor will likely undergo resuspension and transport and additional dispersion from the area resulting in minimal solids accumulation. The results of a depositional model (CASS Tech Report, Appendix F) show that for the estimated production values, net organic carbon accumulation would be at 3.0 grams per meter squared per year ($g/m^2/yr.$) or less for 99.7 % of the test grid. A portion of the organic wastes are expected to be assimilated by the macroinvertebrate community inhabiting the soft sediments in the surrounding area. A more extensive discussion of the potential for impacts to physical resources can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility*, *Appendix C*.

4.2.3 Air Quality

There are no large sources of anthropogenic (man-made) emissions expected to be released into the atmosphere from the project area under the proposed alternative. A tender vessel, which will be moored to the net pen array, may be a small source of emissions in offshore waters. Moreover, trade wind conditions around Florida are likely to quickly disperse these emissions. It is not expected that proposed facility routine marine aquaculture operations would have an adverse impact on air quality. Should EPA receive credible scientific evidence during the comment period that suggests otherwise, the information will be considered prior to issuance of the NPDES permit.

4.2.4 Coastal Barrier Beaches

The proposed action is to be located in approximately 130 m water depth off southwest Florida, approximately 45 miles southwest of Sarasota, Florida. The proposed action will be offshore from any coastal barrier beaches. In accordance with the CZMA, the applicant obtained concurrence from the Florida Department of Environmental Protection for the proposed project, *Appendix H*. It is possible that miscellaneous debris from the aquaculture operation could impact coastal beaches, but it is anticipated that impacts to coastal barrier beaches will be negligible.

4.2.5 Noise Environment

The proposed project's location, approximately 45 miles offshore off the western coast of Florida, is an area with ambient noise from wind, waves, and periodic noise from occasional boat and vessel traffic. The proposed facility is not expected to make a significant contribution to ambient noise and to current open ocean noise.

4.2.6 Climate

As discussed in *Section 3.2.6 Climate*, the effect of ongoing human-caused climate change makes the Gulf environment vulnerable to rising ocean temperatures, sea level rise, storm surge, ocean acidification, and significant habitat loss. The climate in the project area would be as described in *Section 3.2.6 Climate*.

Alternative 1 - No Action. The No Action alternative would result in no effect on the climate because an aquaculture facility would not be built without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits, will likely result in negligible emissions of Green House Gasses (GHGs) resulting from operation of support vessels. The cages could be vulnerable to storm events in the Gulf, however, mitigation measures proposed in the NPDES permit will minimize the potential for damage to the environment from such an event.

4.3 Biological Resources

The biological resources likely to occur in the immediate vicinity of the proposed VE project are described in *Section 3.3 Biological Resources*. The factors with potential to impact biological resources around coastal fish farms are disturbance, entanglement, vessel strikes, and the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. The latter can potentially impact biological communities through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, thereby, affecting benthic biota.

A more extensive discussion of the potential impacts on physical and biological resources associated with the proposed action are provided in the *Appendix C*, *Evaluation of the Ocean Discharge Criteria,*

Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility and the NPDES Permit[FL0A00001] Outer Continental Shelf, Gulf of Mexico and *Appendix D*, *Draft Biological Evaluation – Kampachi Farms, LLC - Velella Epsilon, Marine Aquaculture Facility, Outer Continental Shelf Federal Waters of the Gulf of Mexico, March 15, 2019*.

4.3.1 Fish

Fish species that can occur in the vicinity of the proposed VE project area are discussed in *Section 3.3.1 Fish*. The factors that may impact fish near coastal offshore aquaculture operations are disturbance and water and sediment quality degradation as a result of waste discharges. Potential water quality impacts are associated with discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can potentially impact protected fish through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, affecting benthic habitat.

Alternative 1 - No Action. The No Action alternative would result in no effect on water column biota or benthic communities around the site, including fish, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits, will likely have only very minimal impacts to the fish species expected to occur near the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. In addition, it is expected that fish that may occur at the proposed VE project site would only encounter the facility temporarily since they are motile animals. Exposure to any discharged pollutants will be minimal.

The primary concern with marine cage culture and protected fish tends to be the threat of entanglement with nets, lines or other floating equipment. The large diameter of the anchor line as well as the stiffness of it and other lines make it extremely unlikely that a fish would be entangled. Additionally, the pen will use a rigid copper alloy mesh, which presents no entanglement hazard.

Regarding potential impacts from water and sediment quality, protected fish species are not expected to be impacted given their unique habitat preferences and known proximity to the proposed action area. The Oceanic whitetip shark is not likely to occur near the proposed project given its preference for deeper waters. The action agencies believe that the Nassau grouper will not be present given that it is absent from the Gulf outside of the Florida Keys. Interactions with Smalltooth sawfish with the proposed project is extremely unlikely because they primarily occur in the Gulf off peninsular Florida and are most common off Southwest Florida. The Giant manta ray may encounter the facility given its migratory patterns. However, long term impacts are not expected because the facility is relatively small and is expected to have a short deployment period of approximately 18 months.

The NPDES permit provisions will contain environmental monitoring (water quality, sediment, and benthic infauna) and other conditions that minimize potential adverse impacts to fish from the discharge of effluent from the proposed facility, and prohibit the discharge of certain pollutants (e.g., oil, foam, floating solids, trash, debris, and toxic pollutants). Due to the pilot-scale size of the facility and low density of cultured fish, water quality and benthic effects are not expected to occur outside of 30 m. The discharges authorized by the proposed NPDES permit represent a small incremental contribution of pollutants that are not expected to affect fish species in the project area.

4.3.2 Invertebrates

Marine invertebrates occurring in the Gulf are discussed in *Section 3.3.2 Invertebrates*. The factors that may impact marine invertebrate communities near coastal offshore aquaculture operations are impacts to water and sediment quality. Anchor placement and mooring line sweep may impact sessile benthic invertebrates. Expected discharges from aquaculture operations include dissolved and particulate inorganic and organic nutrients into the water column, total solids deposition, and organic enrichments to seafloor sediments from uneaten feed and fish feces These discharges can potentially impact protected corals through the degradation of water quality, and organic enrichment of benthic sediments, affecting benthic habitat.

Alternative 1 - No Action. The No Action alternative would result in no change to water column biota or benthic communities around the site, including stony corals, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of an NPDES and Section 10 permits, may result in impacts to invertebrate communities in the benthos around the farm site due to benthic loading of discharged solid wastes, however, any impacts to benthic invertebrates are expected to be minimal.

The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. Exposure of benthic invertebrates to any discharged pollutants will be minimal.

The Proposed Action alternative, issuance of an NPDES and Section 10 permits, will likely have no impact to protected corals as none of the listed species are expected to occur near the proposed facility. Additionally, the anchoring system and cage will be placed in an area consisting of unconsolidated sediments, away from potential hardbottom which may contain corals according to the facility's BES.

The discharge from the proposed facility will be covered by a NPDES permit with water quality conditions required by the CWA. The aquaculture-specific water quality conditions contained in the NPDES permit will generally include an environmental monitoring plan (i.e., water quality, sediment, and benthic monitoring) and effluent limitations expressed as best management practices (BMPs). Furthermore, the NPDES will require the proposed facility to be placed at least 500 meters from any hardbottom habitat or coral reefs to protect those communities from physical impacts due to the

deposition of solids and potential impacts due to organic enrichment. Water quality effects are not expected to occur outside of 30 m due to the small size of the facility and low production levels. The impacts from water quality are expected to be minimal or insignificant, and the likelihood that deleterious water quality will contribute to any adverse effects to listed coral species is extremely unlikely.

4.3.3 Marine Mammals

Marine mammals that can occur in the vicinity of the proposed VE project area are discussed in *Section 3.3.3 Marine Mammals*. The greatest risks to Bottlenose or Atlantic spotted dolphins at this site are entanglement, vessel strike and behavioral disturbance. When dolphins become conditioned (a form of behavioral disturbance) to an anthropogenic food source, the risk of vessel strikes, and entanglement increases (Donaldson, Finn, & Calver, 2010).

The greatest risk to dolphins from this operation is entanglement in vertical lines that are associated with the mooring lines and net pen connections. Flexible lines that easily loop are most risk-adverse for dolphins (e.g., shrimp trawl lazy lines (Gearhart & Hataway, 2018) and crab pot buoy lines (Adimey, et al., 2014). The line proposed for the mooring and net pen connection lines (Amsteel blue) is a strong, but flexible line (pers comm. Gearhart, 2018). Entanglement risk to dolphins will depend greatly on the tautness of the line; any slack in the line poses an entanglement risk (Maze-Foley & Mullin, 2006). The copper alloy net mesh enclosing the pen is not anticipated to be an entanglement risk for dolphins given its firm and inflexible state.

Vessel strikes are also a risk for dolphins. As the density of vessels increase in areas utilized by dolphins, so does incident of boat strike injury or mortality to dolphins (Bechdel, et al., 2009). There is likely to be an increase in boat traffic moving back and forth from port to the aquaculture operation. It is recommended that the vessel captain slows to a no wake speed if dolphins are seen nearby and only resumes normal speed when the animals leave the area. If dolphins wake or bow-ride while a vessel is transiting, it is recommended that the vessel captain maintain the vessel's course and speed until the dolphins depart or as long as it is safe to do so.

Dolphins are attracted to concentrated food sources specifically when feeding opportunities exist. There is a possibility that if the animals are fed or are successful at extracting fish from divers or from the pen, the dolphins will become conditioned and change their behavior to spend more time milling around the net waiting for an opportunity to scavenge fish (Christiansen, et al., 2016). When dolphins learn to associate anthropogenic sources with food, unnatural behaviors such as begging or depredating disrupt their natural foraging repertoire and become an abnormal and detrimental feeding strategy (Powell & Wells, 2010). Conditioned dolphins approach humans or anthropogenic food sources more readily looking for handouts, thus increasing the animal's risk for boat strike or gear entanglement (Bechdel, et al., 2009; Powell & Wells, 2010; Samuels & Bejder, 2004; Wells & Scott, 1997). To minimize conditioning of dolphins to the pen, all operations staff must be educated that feeding or attempting to feed wild dolphins is illegal. It is recommended that any divers collecting fish mortalities from the tank remove and dispose of the fish in such a way that does not allow a dolphin an opportunity to scavenge or depredate the discards.

Another factor that may impact protected marine mammals around coastal offshore aquaculture operations are the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. They can potentially impact marine mammal through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, affecting benthic habitat.

Alternative 1 - No Action. The No Action alternative would result in no effect to marine mammals, because the facility would not be constructed or operated at this location on the west Florida Shelf, therefore there is no additional risks being added to this location.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The construction and operation of an aquaculture facility at this site present marine mammal risks that will include entanglement, vessel strike, and behavioral disturbance, however, the level of impact to individual dolphins from these risks is unknown. An aquaculture facility of this type has not yet been operated in the Gulf. As a means to better understand these risks and level of individual impacts, the applicant has agreed to partner with NMFS SERO to collect information on dolphin interactions and behavior around this facility. However, given the large size of these marine mammal stocks and, thus, larger potential biological removal levels, it is anticipated the impacts to the overall population would be minimal.

Entanglement risks to marine mammals will be minimized by using rigid and durable cage materials and by keeping all lines taut. The cage material for the proposed project is constructed with rigid and durable materials. The mooring lines for the proposed project will be constructed of steel chain and thick rope that are attached to a floating cage that will rotate in the prevailing current direction; the floating cage position that is influenced by the ocean currents will maintain the mooring rope and chain under tension during most times of operation. The bridle line that connects from the swivel to the cage will be encased in a rigid pipe. Additionally, the limited number of vertical mooring lines (3) and the duration of cage deployment (approximately 18 months) will reduce the risk of potential entanglement by marine mammals. Furthermore, there have been no recorded incidents of entanglement from ESA-listed marine mammal species interacting with a permitted commercial-scale marine aquaculture facility in Hawaii (Blue Ocean Mariculture, 2014); interactions are anticipated to be highly unlikely. Because of the proposed project operations and proximity to marine mammal habitat, the action agencies expect that the effects of this entanglement interaction would be discountable; however, should entanglement occur, on-site staff would follow the steps outlined in the Protected Species Management Plan (PSMP) and alert the appropriate experts for an active entanglement.

In regard to vessel strikes, facility staff will be stationed on one vessel for the duration of the project except during unsafe weather conditions. The probability that collisions with the vessel associated with the proposed project would kill or injure marine mammals is discountable as the vessel will not be operated at speeds known to injure or kill marine mammals. Given the limited trips to the facility with only one vessel, and the high visibility of whales to small vessels, opportunities for strikes from the vessel participating in the proposed project are expected to be insignificant. Strikes from other vessels not operated by the facility are anticipated to be improbable due to the proximity to shore. Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS.

Disturbance to marine mammals from ocean noise generated by the proposed facility is expected to be extremely low given that the there is one production cage and one vessel that will be deployed for a duration of approximately 18 months. The action agencies believe that the underwater noise produced by operating a vessel and cage are minimal and will not interfere with the ability of marine mammals to communicate, choose mates, find food, avoid predators, or navigate.

4.3.4 Sea Turtles

Sea turtles that can occur in the vicinity of the proposed VE project site are discussed in *Section 3.3.4 Sea Turtles*. The factors that may impact protected sea turtles near coastal offshore aquaculture operations are impacts to water quality, entanglement, physical encounters with the pen system, and behavioral disturbance.

Alternative 1 - No Action. The No Action alternative would result in no effect on water column biota or benthic communities around the site, including sea turtles, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. Sea turtles frequent reefs and other areas with submerged structures (Stoneburner, 1982; Booth & Peters, 1972; Witzell W. N., 1982; Carr A. F., 1952) and may be attracted to the project area for food, shelter, and/or rest. The primary concern with marine cage culture and listed sea turtles and fish tends to be the threat of entanglement with nets, lines or other floating equipment. However, the large diameter of the anchor line as well as the stiffness of it and the other lines make it extremely unlikely that a sea turtle would be entangled. Mooring lines are designed to be kept taught, reducing the potential for entanglements. Additionally, the pen will use a rigid copper alloy mesh, which presents no entanglement hazard.

Sea turtles may be indirectly affected by the proposed facility if it concentrates hook-and-line (i.e., rod and reel) fishermen in the vicinity. Sea turtles are known to bite baited hooks and can be hooked incidentally by these fishermen. Sea turtles do not transmit social information regarding new foraging locations and opportunities like dolphins do thus, we do not believe such indirects to result in additional reef fish fishing interactions with sea turtles.

Sea turtles may experience disturbance by stress due to a startled reaction should they encounter vessels in transit to the proposed project site. Given the limited trips to the site, opportunities for disturbance from vessels participating in the proposed project are minimal. ESA-listed sea turtles may be attracted to aquaculture facilities as potential sources of food, shelter, and rest, but behavioral effects from disturbance are expected to be insignificant. Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS. Furthermore, there has been a lack of documented observations and records of ESA-listed sea turtles interacting with a permitted commercial-scale marine aquaculture facility in Hawaii (Blue Ocean Mariculture, 2014). The EPA anticipates that such interactions would be unlikely. As a result, disturbance from human activities and equipment operation resulting from the proposed action is expected to have insignificant effects on ESA-listed reptiles.

Sea turtles located in close proximity to an offshore aquaculture operation could also be impacted by the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can impact through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, affecting benthic biota and habitat. However, the siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. In addition, it is expected that sea turtles that may occur at the proposed VE project site area would only encounter the facility temporarily since they are pelagic animals. Exposure to any discharged pollutants will be minimal.

The risk of sea turtles being entangled in offshore aquaculture operation is greatly reduced by using rigid and durable cage materials and by keeping all lines taut. The cage material for the proposed project is constructed with rigid and durable materials. The mooring lines for the proposed project will be constructed of steel chain and thick rope that are attached to a floating cage that will rotate in the prevailing current direction; the floating cage position that is influenced by the ocean currents will maintain the mooring rope and chain under tension during most times of operation. Additionally, the bridle line that connects from the swivel to the cage will be encased in a rigid pipe. Moreover, the limited number of vertical mooring lines (three) and the duration of cage deployment (less than 18 months) will reduce the risk of potential entanglement by sea turtles. Because of the proposed project operations and duration, the action agencies expect that the effects of this entanglement interaction would be discountable. However, should entanglement occur, on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement.

4.3.5 Birds

Birds that may occur in the vicinity of the proposed VE project site are discussed in *Section 3.3.5 Birds*. Potential impacts to seabirds from the VE project could be related to the physical structure, presence of fish, and associated activities that would attract migratory seabirds as well as other migratory birds. A number of species, such as Common loons (*Gavia immer*) and Double-crested cormorants (*Phalacrocorax auratus*) may dive from the surface near the facility to try to access small fishes underwater, whereas Brown pelicans (*Pelecanus occidentalis*), Northern gannets (*Morus bassanus*), Masked boobies (*Sula dactylatra*), Brown boobies (*Sula leucogaster*), and Red-footed boobies (*Sula sula*) may attempt to plunge dive into the cage and may be injured by the taut mesh covering the tops of the cages. Cage covering should limit the visibility of fish in cages, reducing diving activity.

Alternative 1 - No Action. The No Action alternative would result in no effect on seabirds and other migratory birds occurring in the area, because, without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have only very minimal impacts to the seabirds and other migratory birds expected to occur in the vicinity of the proposed facility.

The EPA and USACE considered disturbance as the only potential stressor to ESA-protected seabirds from the proposed project. Seabirds are not expected to interact with the proposed project or become trapped in the cage due to distance of the proposed project from shore (approximately 45 miles). The Piping plover is a shorebird that primarily inhabits coastal sandy beaches and mudflats. The Red knot is a highly migratory species. However, their known migratory routes do not overlap with the proposed project and migration and wintering habitat for the Red knot are in intertidal marine habitats such as coastal inlets, estuaries, and bays (FWS, 2014). Should there be any interaction that results in an injury to a protected seabird, the on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement.[10] The project staff will suspend all surface activities, including stocking, harvesting operations, and routine maintenance operations in the unlikely event that an ESA-listed seabird comes within 100 m of the activity until the bird leaves the area. Any potential effects from the proposed action on ESA-listed birds are discountable because the effects are extremely unlikely to occur.

4.3.6 Essential Fish Habitat

The Gulf of Mexico Fishery Management Plans and essential fish habitat that apply to the proposed VE project site are discussed in *Section3.3.6 Essential Fish Habitat*. The main factors most likely to impact managed fishes, shellfish and essential fish habitat around offshore aquaculture operations are the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can cause impacts through the degradation of water quality, affecting pelagic early life stages and adult stages of animals, and through organic enrichment of benthic sediments, affecting demersal and benthic fish and shellfish species and critical benthic habitat. A more extensive discussion of the potential for impacts of fish farming to managed fishes and essential fish habitat can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility*, *Appendix C and Appendix D*, *Threatened and Endangered Species Assessment*.

Alternative 1 - No Action. The No Action alternative would result in no effect on either pelagic or benthic fishes or essential fish habitat around the proposed VE site because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to managed fishes and essential fish habitat expected to occur in the vicinity of the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. Small loading rates and rapid dilution of dissolved constituents downstream of the cage is expected to minimize exposure to early life stages of fish and shellfish in the

[10] A PSMP has been developed by the applicant with assistance from the NMFS Protected Resources Division. The purpose of the PSMP is to provide monitoring procedures and data collection efforts for species (marine mammals, sea turtles, seabirds, or other species) protected under the MMPA or ESA that may be encountered at the proposed project.

water column. The relatively low production of solid wastes and the wide dispersal of discharged solids to the benthos should minimize impacts to benthic fishes. Additionally, the proposed VE site will be located over unconsolidated sediments, limiting any potential impacts to reef fishes associated with live bottom. The EPA provided an EFH assessment to the NMFS for consideration on our determination that the proposed project would not result in substantial adverse effects on EFH and the permits will have conditions to mitigate any minor impacts that may occur (Appendix E).

4.3.7 Deepwater Benthic Communities

Deepwater benthic communities do not occur within a distance of approximately 90 miles or more, seaward of the proposed VE site. Therefore, no impact on this resource is expected.

4.3.8 Live Bottoms

Live bottom communities in the vicinity of the proposed VE project location are discussed in *Section 3.3.8 Live Bottoms*. The main impact causing factor to live bottom communities around offshore aquaculture operations is the discharge of total solids consisting of uneaten feed and fish feces, resulting in solids deposition and organic enrichments to seafloor sediments. These discharges can cause impacts through the degradation of water and sediment quality, burial, and through organic enrichment of benthic sediments, affecting demersal and benthic fish and macroinvertebrate species and critical benthic habitat. A more extensive discussion of the potential for impacts of offshore aquaculture operations to live bottom habitat and associated communities can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility*, *Appendix C.*

Alternative 1 - No Action. The No Action alternative would result in no effect on live bottom habitat and associated biological communities around the proposed VE site because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to live bottom habitat and associated communities expected to occur in the vicinity of the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. The relatively low production of solid wastes from the single cage facility and the wide dispersal of discharged solids to the benthos should minimize impacts to live bottoms. Additionally, the proposed VE site will be located over unconsolidated sediments, limiting any potential physical and biological impacts to live bottoms. Positioning away from potential live bottom habitat will mitigate physical benthic impacts from anchors and mooring lines. The cage is designed to swivel around the center of a suspended 3-point mooring, further reducing anchor chain sweep.

4.3.9 Seagrasses

Seagrasses occurring on the west Florida shelf are discussed in *Section 3.3.9 Seagrasses*. Because seagrass distribution is dependent on water clarity for light penetration, the main impact causing factor

to sea grasses around offshore aquaculture operations is the discharge of suspended solids consisting of uneaten feed and fish feces, resulting in reduced water clarity and light attenuation. Paddle grass was not observed at the Tampa ODMDS at depths ranging from 14-27m (40-80 ft.), likely due to low water clarity. Additionally, impacts may also result from solids deposition and organic enrichments to seafloor sediments.

Alternative 1 - No Action. The No Action alternative would result in no effect on seagrasses and associated biological communities around the proposed VE site because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have only very minimal impacts to sea grasses and associated communities as they are not expected to occur in the vicinity of the proposed facility. In addition, the siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid and broad dispersion of suspended solids discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. The relatively low production of solid wastes from the single cage facility and the wide dispersal of discharged solids to the benthos should minimize impacts to seagrasses.

4.4 Social and Economic Environment

The following sections focus on the proposed action impacts on four primary areas: aquaculture production, commercial fishing, recreational fishing, human health/public health, and environmental justice.

4.4.1 Commercial Marine Aquaculture Production

This project is not expected to have an adverse socio-economic impact on current commercial aquaculture production or producers in the Gulf because finfish production in the Gulf has been limited to freshwater species, such as catfish or tilapias, and Almaco jack is not a substitute for those species.

Alternative 1: No Action. The No Action alternative would result in no effect commercial marine aquaculture production, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2: It is not expected the proposed project will negatively impact commercial marine aquaculture production in the Gulf.

4.4.2 Commercial Fisheries

A discussion of the status of commercial fisheries is provided in *Section 3.4.3 Commercial Landings of Almaco Jack and Section 3.4.4 Commercial Fisheries*. The potential for impacts to commercially important fin fishes and invertebrates were discussed above in *Section 4.3.1 Fish and Section 4.3.2 Invertebrates.*

As stated previously and should be emphasized, Almaco jack is not a targeted commercial fish. It is only harvested incidentally. Consequently, production of farmed Almaco jack from the proposed VE project is not expected to have an adverse economic impact on commercial fishing businesses that land Almaco jack.

The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. Exposure to any discharged pollutants will be minimal.

Additionally, the proposed site was selected to minimize potential conflicts with shrimping and other commercial fishing activities in the area. A more extensive discussion of the potential for impacts of fish farming to commercial fisheries can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility, Appendix C*.

Alternative 1: No Action. The No Action alternative would result in no effect on commercial fisheries around the site, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES, and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to commercial fishing industry.

4.4.3 Recreational Fishing

Recreational fishing that may occur in the vicinity of the proposed VE site is discussed in *Section 3.4.5 Recreational Marine Fishing*. The factors most likely to impact recreational fisheries around offshore aquaculture operations are the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can impact through the degradation of water quality, affecting sensitive early life stages of marine fishes, and organic enrichment of benthic sediments, affecting habitat that supports juvenile and adult fish communities and surrounding food sources. In addition, siting of stationary fish farms may interfere with recreational fishing activities. A more extensive discussion of the potential for impacts of fish farming to commercial fisheries can be found in the *ODCE for Kampachi Farms – Velella Epsilon Net Pen Fish Culture Facility, Appendix C.*

Alternative 1 - No Action. The No Action alternative would result in no effect on early life stages of fish water column or benthic fish communities around the site, because an aquaculture facility would not

be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to recreational fisheries that may occur in the vicinity of the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. Exposure to any discharged pollutants will be minimal. Additionally, the proposed site was selected to minimize potential conflicts with recreational fishing activities in the area.

4.4.4 Human Health/Public Health

Contamination from the use of the use of pharmaceuticals (Section 4.2.1.1) to prevent and control disease in farmed fish and impacts to water and sediment quality (Sections 4.2.1 and 4.2.2) are potential sources of bioaccumulated contaminants that can affect farmed fish quality. Consumption of farmed fish exposed to pathogens and pollutants discharged from the aquaculture facility or in the open marine environment could pose health risks to consumers. It is expected that potential adverse human health outcomes are avoided or minimized based on the impact discussions presented in the following sections of the EA: *Water Quality (4.2.1), Pharmaceuticals (4.2.1.1), and Sediment Quality (4.2.2).*

Alternative 1 - No Action. The No Action alternative would result in no effect on human health, because an aquaculture facility would not be able to discharge any operational wastes without an NPDES permit, and, without a Section 10 permit, the facility would not be constructed or operated at this location on the west Florida Shelf.

Alternative 2 - Proposed Action, Issuance of NPDES and Section 10 Permits. The Proposed Action alternative, issuance of NPDES and Section 10 permits will likely have minimal impacts to human health due to water and sediment quality and fish health. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. A small harvest is also a fishery management measure of disease control and prevention in farmed fish (Section 3.2.1.3 Pharmaceuticals). Based on these factors, there are no significant human health/public health impacts expected as a result of the proposed action.

4.4.5 Environmental Justice

Environmental justice (EJ) ensures that minority and low-income populations are not subject to disproportionately high and adverse human health or environmental effects due to a proposed action. As discussed in *Section 4.4.4 Human Health/Public Health*, contaminated fish resulting in adverse human health outcomes is the same concern for EJ communities. The discharges authorized under this permit are not expected to adversely impact farmed fish quality. Therefore, greater human health risks to

minority and low-income populations from contaminated farmed fish is not expected. Refer to *Section 4.4.4 Human Health/Public Health* for the result of aquaculture and human health, and the alternative effects.

The proposed action footprint would be relatively small and located well out to sea. There are no minorities or low-income populations near the proposed action, but such populations may exist in communities living onshore near staging areas used for the proposed VE project.

The proposed action would not cause changes to the physical or natural environment that would affect coastal communities. The proposed action would not inhibit persons from any nearby communities from fishing near the action area. Also, farmed fish landings from the proposed action are not expected to effect commercial landings of Almaco jack because it is not directly targeted and is incidentally caught by commercial fishermen. For these reasons, Alternative 2 is not likely to impact adversely fish or other wildlife, habitats, or marine plants that are subsistence resources.

Finally, the proposed action is not expected to have disproportionately high and adverse environmental or human health effects to minority and low-income populations that would require further consideration under E.O. 12898.

5.0 Cumulative Impacts

The Council on Environmental Quality's (CEQ) regulations define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR Section 1508.7). For this proposed action, it was determined that the scope of the cumulative impacts analysis should encompass the project study area and should extend the life of the permit action (5 years). As a part of this analysis, past, present and reasonably foreseeable future actions that were considered included the 2010 Deep Water Horizon (DWH) oil spill, oil and gas operations, future aquaculture operations and natural disasters. As noted in *1.9 Documents Incorporated by Reference* of this EA, several previous NEPA documents are adopted by reference. Information from these documents were used extensively in determining the cumulative impacts of the proposed action. This analysis considers the cumulative impacts related to the preferred alternative (Alternative 2). Below is a brief summary of issues and resource specific discussion related to cumulative impacts in the context of the proposed action:

5.1 DWH

On April 20, 2010, the DWH mobile drilling unit exploded, caught fire, and eventually sank in the Gulf, resulting in a massive release of oil and other substances from British Petroleum's Macondo well. The Macondo well is located more than 300 miles North/Northwest of the proposed location of the VE project. Regarding DWH, the NFMS conducted a thorough evaluation of direct, indirect and cumulative impacts associated with the DWH in their 2015 *Final Supplement to the Final Programmatic Environmental Impact Statement for the Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico.* EPA notes that on page 62 of this document NFMS concluded that "*several studies have produced preliminary information on the impacts of the DWH blowout to marine organisms and ecosystems in the Gulf. More information on the short- and long-term impacts of the DWH blowout is needed to assess whether the additional stress caused by the DHW blowout has resulted in a cumulative effect beyond current thresholds."* (NMFS, 2015b). The EPA and USACE concurs with these findings and recognize that the cumulative impacts associated with DWH are still relatively unknown at this time and the minor incremental impact of the proposed action would have little cumulative impact to the Gulf.

5.2 Oil and Gas Operations

Oil and gas operations are common in the Gulf. To evaluate the proposed action in the context of oil ang gas activities EPA and USACE considered information from both the EPA's 2016 *National Pollutant Discharge Elimination System (NPDES) Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Product Environmental Assessment* (EPA, 2016) and the NMFS's 2015 *Final Supplement to the Final Programmatic Environmental Impact Statement for the Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico* (NMFS, 2015b). As noted in the EPA EA (*1.4.3 Moratoria*) (EPA, 2016). Currently, there are no OCS areas restricted under Congressional moratoria. However, in 2006 GOMESA [Gulf of Mexico Energy Security Act] was enacted to restrict oil and gas leasing in portions of the Gulf through 2022. This action restricts leasing within 125 miles of Florida in the eastern Gulf and within 100 miles of Florida in the central Gulf.

The EPA notes that the proposed action is approximately 45 miles off the coast of Florida and within the GOMESA restricted area. The EPA and USACE conclude that the proposed action would have negligible cumulative impacts regarding oil and gas operations because it is located in the drilling moratoria area.

5.3 Future Aquaculture Operations

At present, there has only been one application received for which this EA is being developed and another project (Manna Fish Farms) which is being proposed for an area located in the Northern Gulf. This cumulative impact evaluation considered the incremental impacts associated with the aquaculture impacts associated with this EA in combination with the future aquaculture operations proposed in the Manna Fish Farms pre-application that is within the 5-year permit time frame. The Manna Fish Farms proposes siting their facility off shore and south of Pensacola, FL. This project is planned to be a commercial scale project. The location of the proposed Manna Fish Farm operations is approximately 300 miles from the operations proposed in this EA. Because of the significant distance between the two aquaculture operations, the two operations would have negligible cumulative impacts on the Gulf. However, EPA believes that it is reasonably foreseeable that the growth of the aquaculture industry in the Gulf will occur at future point if these facilities are successful.

5.4 Physical Resources

As previously discussed in *Section 4.2 Physical Resources*, solid waste from the aquaculture operations is the physical resource of concern and it was determined that the solid waste deposition would be minimal. The incremental effect of the Proposed Action, issuance of the NPDES and Section 10 permits would have minimal impact even combined with the other proposed project (Manna Fish Farms) for aquaculture operations throughout the project area. Solid waste from the VE project and any future aquaculture project would likely re-suspend and disperse. Other activities in the project area that were considered such as any future oil and gas operations would cumulatively add little solid waste to the project area.

5.4.1 Water Quality

As discussed in *Section 4.2.1 Water Quality*, the proposed action, issuance of the NPDES and Section 10 permits would produce ammonia levels significantly below the published ammonia aquatic life criteria values for saltwater organisms (EPA, 1989). At present, there is only one NPDES permit application for an aquaculture facility submitted to EPA in the Gulf (for which is the proposed action of this EA) and one proposed project (Manna Fish Farms) discussed above. Also, the proposed action and Manna Fish Farms proposed location are over 300 miles apart. Thus, it is anticipated that both actions combined would cause negligible cumulative impacts to water quality.

In the USEPA Region 4's 2016 Environmental Assessment (EA) for *National Pollutant Discharge Elimination System (NPDES) Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Production*, it was determined that water quality impacts associated with drilling activities such as drilling fluids and cuttings during daily operations even combined with relatively infrequent and low volume discharges such as WTCW fluids; deck drainage; sanitary and domestic wastes; and miscellaneous wastes were minor water quality impacts. As previously discussed, there is a moratorium on oil and gas operations within 125 miles of the Florida coast (EPA, 2016) and the

proposed action is within that moratoria zone. Also, previously discussed, it was concluded that the proposed action would have negligible cumulative impacts in relationship to large scale oil spills (such as DWH).

There is a potential for water quality impacts associated with spills related to other shipping activities (such as cargo ship spills, fuel spills due to ship wrecks or related to ship loss due to storms). However, because of the minor water quality impacts associated with the Proposed Action it would have minor cumulative impacts associated with spills from other shipping activities.

Additionally, the minor amount of ammonia produced by the Proposed Action would not incrementally increase the cumulative impacts associated with other activities such as the proposed future oil and gas activities, future aquaculture activities and any lingering environmental impacts associated with the DWH.

5.4.1.1 Pharmaceuticals

As discussed in *Section 4.2.1.1 Pharmaceuticals*, the amounts of pharmaceuticals discharged will have minimal direct impacts. The only other known facility within the Gulf that would have pharmaceutical impacts would be the proposed Manna Fish Farm facility. As previously discussed, the Manna Fish Farm would be over 300 miles in distance from the aquaculture operation being proposed so these facilities would have negligible cumulative impacts to the Gulf.

In addition, the NPDES permit for the VE project will require that the use of any medicinal products including therapeutics, antibiotics and other treatments are to be reported to the EPA. The report will include types and amounts of medicinal product used and the period of time it was used.

5.4.2 Sediment Quality

As discussed in *Section 4.2.2 Sediment Quality*, numerous studies within the Mediterranean have shown that organic inputs from fish farms on benthic macrofaunal are only limited up to 25 m from the edge of the cages (Lampadariou, Karakassis, & Pearson, 2005) and carbon and nitrogen produced by fish farm effluents on the sea floor is detected in an area about 1,000 m from the cages (Sara, Scilipoti, Mazzola, & Modica, 2004). Also, the organic material will most likely re-suspend and be dispersed and will not accumulate in any concentrations on the sea bed floor. Any remaining accumulation of organic material would also be assimilated by macroinvertebrates living on the sea floor. Other potential sources of organic and inorganic discharges near the proposed action could potentially be from point source discharges such as land-based wastewater treatment and industrial discharges, discharges from septic tanks and non-point discharges from stormwater. Additionally, waste from ships could contribute to cumulative impacts associated with organic and inorganic pollution. It is unlikely that organic and nitrogen from land-based discharges would reach the proposed facility 45 miles offshore. Conversely, the effluent from the cages will have minimal impact and would not travel past 1,000 m to incrementally combine with these other organic and nitrogen laden discharges to cause a cumulative impact. The ODCE anticipates impacts from the VE facility will likely be limited to 300 m—500 m from the perimeter of the cage (Appendix C). As previously stated, the other only known potential aquaculture facility (Manna Fish Farm) is more than 300 miles away from the proposed facility and would not incrementally contribute to the cumulative impacts in the study area.

5.4.3 Air Quality

As discussed in *Section 4.2.3 Air Quality*, there are no large sources of anthropogenic emissions expected to be released into the atmosphere from activities related to the proposed action. Aside from the aquaculture facility, there may be some emissions from outboard motors used by sport fisherman and commercial fishing operations. A tender vessel, used on site at the facility, may be a small source of emissions in offshore waters; however, cumulative impacts from sources are expected to be minimal. Should EPA receive credible scientific evidence during the comment period that suggests otherwise, the information will be considered prior to issuance of the NPDES permit.

5.4.4 Coastal Barrier Beaches

As discussed in *Section 4.2.4 Coastal Barrier Beaches*, the VE project is to be located approximately 45 miles southwest of Sarasota and offshore from any coastal barrier beaches. Debris from the aquaculture operation could accumulate and impact coastal beaches, but cumulative impacts to coastal barrier beaches will be negligible.

5.4.5 Noise Environment

As discussed in *Section 4.2.5 Noise Environment*, the VE project location is an area with ambient noise from wind, waves, and periodic noise from occasional boat and vessel traffic. Noise generated by the site would remain at low levels and likely not be heard once coupled with water and wind effects that would dampen any sounds originating at the facility. Cumulative impacts from noise are anticipated to be negligible.

5.4.6 Climate

As discussed in Section *4.2.6 Climate,* the VE project will result in negligible emissions of Green House Gasses (GHGs) resulting from operation of support vessels. In general, aquaculture is considered to make a minor, contribution to greenhouse gas emissions although the extent to which this occurs depends on the species, size and location of facilities (Food and Agriculture Organization of the United Nations, 2009). Additional contributors to GHG emissions in the Gulf include oil and gas operations, commercial and recreational fishing operations, commercial shipping, and recreational boating.

While the proposed project may minimally contribute to global emissions, global climate change could have significant effects on Gulf aquaculture operations. Climate change may affect the severity of extreme weather (e.g., hurricanes), potentially generating more intense storms which could lead to increases in storm-induced damage to equipment and facilities (IPCC, 2007; IPCC, 2013). The VE project cages could be vulnerable to more frequent storm events in the Gulf, however, mitigation measures in the NPDES permit will minimize the potential for damage to the environment from such an event.

Other possible impacts of climate change include temperature changes which can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems;

altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (IPCC, 2007). None of these potential climate change impacts are expected to be significant with respect to the NPDES permit duration of 5 years.

5.5 Biological Resources

As previously discussed in *Section 4.3 Biological Resources*, the factors with potential to impact biological resources around coastal fish farms are disturbance, entanglement, vessel strikes, and the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. The latter can potentially impact biological communities through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, thereby, affecting benthic biota.

The EPA has determined that the small incremental effect of the Proposed Action, issuance of the NPDES and Section 10 permits would have minimal impact even combined with the other proposed projects (Manna Fish Farms) for aquaculture operations throughout the project area. Solid waste from the VE project and any future aquaculture project would likely re-suspend and disperse. Other activities in the project area that were considered when evaluating potential impacts on biological resources included future oil and gas operations which would cumulatively add little solid waste to the project area.

5.5.1 Fish

Fish that can occur in the vicinity of the proposed VE project area are discussed in *Section 3.3.1 Fish*. In general, the factors that may impact fish near coastal offshore aquaculture operations are disturbance and water and sediment quality degradation as a result of waste discharges. Potential water quality impacts are associated with discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can potentially impact protected fish through the degradation of water quality, affecting pelagic plants and animals, and organic enrichment of benthic sediments, affecting benthic habitat. Cumulative impacts to water quality may include discharges of dissolved and particulate inorganic and organic nutrients into the water column, and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. Other potential sources of organic and inorganic discharges are waste from ships and point sources such as land-based wastewater treatment, industrial discharges, discharges from septic tanks, and non-point discharges from stormwater. It is not expected that the discharges from the VE project would incrementally combine with these other discharges because the proposed facility is 45 miles offshore in an area selected for enhanced currents.

There are also physical impacts throughout the Gulf that could cause fish mortality such as entanglement in fishing gear and other floating material, and digestion of plastics. However, due to the small size of the VE project and the expected temporary nature of the proposed project it is anticipated that this proposed action would have minor to negligible impacts and would not cumulatively impact fish.

As previously stated, the other only known potential aquaculture facility being proposed in the Gulf (Manna Fish Farm) is more than 300 miles away from the proposed facility and would not incrementally contribute to the cumulative impacts in the study area. Given the relatively small footprint of the VE project in context of the previously discussed impacts, it is anticipated that this proposed action would have minimal to negligible impacts and would not cumulatively impact fish. Furthermore, the EPA and USACE will include permit provisions that will contain environmental monitoring (water quality, sediment, benthic infauna, etc.) and other conditions that minimize potential adverse impacts to fish.

5.5.2 Invertebrates

Marine invertebrates occurring in the Gulf are discussed in *Section 3.3.2 Invertebrates*. The factors that may impact marine invertebrate communities near coastal offshore aquaculture operations are impacts to water and sediment quality. Anchor placement and mooring line sweep may impact sessile benthic invertebrates. Expected discharges from aquaculture operations include dissolved and particulate inorganic and organic nutrients into the water column, total solids deposition, and organic enrichments to seafloor sediments from uneaten feed and fish feces These discharges can potentially impact protected corals through the degradation of water quality, and organic enrichment of benthic sediments, affecting benthic habitat. Other potential sources of organic and inorganic discharges are waste from ships and point sources such as land-based wastewater treatment, industrial discharges, discharges from septic tanks, and non-point discharges from stormwater. However, it is not expected that the discharges from the VE project would incrementally combine with these other discharges because the proposed facility is 45 miles offshore in an area selected for enhanced currents.

Additionally, as previously stated, the other only known potential aquaculture facility being proposed in the Gulf (Manna Fish Farm) is more than 300 miles away from the proposed facility and would not incrementally contribute to the cumulative impacts in the study area. Given the relatively small footprint of the VE project in context of the previously discussed impacts, it is anticipated that this proposed action would have minimal to negligible impacts and would not cumulatively impact invertebrates. Furthermore, the EPA and USACE will include permit provisions that will contain environmental monitoring (water quality, sediment, benthic infauna, etc.) and other conditions that minimize potential adverse impacts to invertebrates.

5.5.3 Marine Mammals

Marine mammals occurring in the Gulf are discussed in *Section 3.3.3 Marine Mammals*. The factors that may impact marine mammals near coastal offshore aquaculture operations are potential entanglement, vessel strikes, behavioral disturbance, and impacts to water and sediment quality. Entanglement risks to marine mammals will be minimized by using rigid and durable cage materials and by keeping all lines taut, however, should entanglement occur, on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement. Facility staff will monitor for the potential of vessel strikes, however, the probability that collisions with the vessel associated with the proposed project would kill or injure marine mammals is discountable as the vessel will not be operated at speeds known to injure or kill marine mammals. Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS. Disturbance to marine mammals from ocean noise generated by the proposed facility is expected to be extremely low given that the there is one production cage and one vessel that will be deployed for a duration of approximately 18 months.

Expected discharges from aquaculture operations include dissolved and particulate inorganic and organic nutrients into the water column, total solids deposition, and organic enrichments to seafloor sediments from uneaten feed and fish feces These discharges can potentially impact protected corals through the degradation of water quality, and organic enrichment of benthic sediments, affecting benthic habitat. Other potential sources of organic and inorganic discharges are waste from ships and point sources such as land-based wastewater treatment, industrial discharges, discharges from septic tanks, and non-point discharges from stormwater. However, it is not expected that the discharges from the VE project would incrementally combine with these other discharges because the proposed facility is 45 miles offshore in an area selected for enhanced currents.

Since the VE project has a very low potential of impacting marine mammals by entanglement, vessel strikes, behavioral disturbance, and impacts to water and sediment quality, the overall cumulative impact potential for VE project is negligible.

5.5.4 Sea Turtles

Sea turtles occurring in the Gulf are discussed in *Section 3.3.4 Sea Turtles*. The factors that may impact protected sea turtles near coastal offshore aquaculture operations are impacts to water quality, entanglement, physical encounters with the pen system, and behavioral disturbance.

Entanglement risks to sea turtles will be minimized by using rigid and durable cage materials and by keeping all lines taut, additionally, the pen will use a rigid copper alloy mesh, which presents no entanglement hazard. Sea turtles may experience disturbance by stress due to a startled reaction should they encounter vessels in transit to the proposed project site. Given the limited trips to the site, opportunities for disturbance from vessels participating in the proposed project are minimal. Disturbance to sea turtles by the proposed facility is expected to be extremely low given that the there is one production cage and one vessel that will be deployed for a duration of approximately 18 months. Potential water quality impacts associated with discharges from aquaculture operations include dissolved and particulate inorganic and organic nutrients into the water column, total solids deposition, and organic enrichments to seafloor sediments from uneaten feed and fish feces These discharges can potentially impact protected corals through the degradation of water quality, and organic enrichment of benthic sediments, affecting benthic habitat. Other potential sources of organic and inorganic discharges are waste from ships and point sources such as land-based wastewater treatment, industrial discharges, discharges from septic tanks, and non-point discharges from stormwater. However, it is not expected that the discharges from the VE project would incrementally combine with these other discharges because the proposed facility is 45 miles offshore in an area selected for enhanced currents.

Since the VE project has a very low potential of impacting sea turtles by entanglement, physical encounters with the pen system, behavioral disturbance, and water quality the overall cumulative impact potential for VE project is negligible.

5.5.5 Birds

Birds occurring in the Gulf are discussed in *Section 3.3.5 Birds*. Potential impacts to seabirds from the VE project may be due to the physical structure, presence of fish, and associated activities that would attract migratory seabirds as well as other migratory birds. Seabirds are not expected to interact with the

proposed project or become trapped in the cage due to distance of the proposed project from shore (approximately 45 miles). Should there be any interaction that results in an injury to a protected seabird, the on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement. The project staff will suspend all surface activities, including stocking, harvesting operations, and routine maintenance operations in the unlikely event that an ESA-listed seabird comes within 100 m of the activity until the bird leaves the area. Any potential effects from the proposed action on ESA-listed birds are discountable because the effects are extremely unlikely to occur.

Since the VE project has a very low potential of impacting birds due to the low potential for presence at the site the overall cumulative impact potential for VE project on birds is negligible.

5.5.6 Essential Fish Habitat

The environmental factors most likely to impact essential fish habitat around offshore aquaculture operations are the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. These discharges can impact through the degradation of water quality, affecting habitat critical to sensitive early life stages of marine invertebrates and pelagic adult forms. Organic enrichment of benthic sediments can impact habitat that supports juvenile and adult invertebrate communities and surrounding food sources.

As previously discussed the Proposed Action alternative, issuance of an NPDES and Section 10 permits will likely have only very minimal impacts to essential fish habitat expected to occur near the proposed facility. The siting analysis conducted during the site selection process chose an area with sufficient depth and current flow parameters that should result in rapid dilution of dissolved wastes and broad dispersion of solid wastes discharged from the facility. The relatively small fish biomass to be reared in the single cage (74,800 lbs. at harvest) demonstration is also expected to result in small daily loading rates of discharged pollutants downstream of the cage. In addition, pelagic animals passing through the area and would be at the facility temporarily. Exposure to any discharged pollutants would be minimal.

Other potential sources of organic and inorganic discharges near the VE project could potentially be from point source discharges such as land-based wastewater treatment and industrial discharges, discharges from septic tanks and non-point discharges from stormwater. Additionally, waste from ships could contribute to cumulative impacts associated with organic and inorganic pollution. It is unlikely that organic and nitrogen from land-based discharges would reach the proposed facility 45 miles off shore Conversely, the effluent from the cages will have minimal impact and would not travel past 1,000 m to incrementally combine with these other organic and nitrogen laden discharges to cause a cumulative impact. The ODCE anticipates impacts from the VE facility will likely be limited to 300 m—500 m from the perimeter of the cage (Appendix C). As previously stated, the other only known potential aquaculture facility (Manna Fish Farm) would occur more than 300 miles away from the proposed facility and, thus, would not incrementally contribute to the cumulative impacts in the study area.

Additionally, impacts related to natural disasters combined with the previously discussed impacts could cumulatively impact protected marine habitat. On page 363 in the NMFS PFEIS, it was documented that the impacts related to natural disasters and economic change that "*can also affect resources, ecosystems, and communities. Such events include diseases outbreaks, red tides, changes in economic conditions,*

foreign imports, high fuel prices, hurricanes and storm events, and hypoxia" (Gulf of Mexico Fishery Management Council and National Oceanic and Atmospheric Adminstration National Marine Fisheries Service, 2009). However, it is anticipated that the cumulative impacts associated with the proposed action and natural disasters (such as storms, hurricanes, red tides, etc.) would be minor. The EPA provided an EFH assessment to the NMFS for consideration on our determination that the proposed project would not result in substantial adverse effects on EFH and the permits will have conditions to mitigate any minor impacts that may occur (Appendix E).

5.5.7 Deepwater Benthic Communities

Deepwater benthic communities do not occur within a distance of approximately 90 miles or more, seaward of the proposed VE site. Therefore, no cumulative impact on this resource is expected.

5.5.8 Live Bottoms

The main impact causing factor to live bottom communities around coastal fish farms is the discharge of total solids consisting of uneaten feed and fish feces, resulting in solids deposition and organic enrichments to seafloor sediments. These discharges can affect water and sediment quality and may lead to eutrophication of both, in turn affecting the benthic habitat and dynamic as a whole.

Cumulative impacts to live bottom habitats in the vicinity of the proposed facility are expected to be minimal due to sufficient depth and flow parameters at the site that result in rapid dispersion of waste. Small daily loading rates of discharged pollutants are anticipated due to the small fish biomass being reared. This coupled with a wide dispersal of discharged solids limits impacts to live bottoms.

5.5.9 Seagrasses

Seagrass growth is dependent on water clarity for light penetration. As with live bottoms, the main impact causing factor to seagrasses around offshore aquaculture operations is the discharge of total solids consisting of uneaten feed and fish feces.

Cumulative impacts to seagrasses are expected to be minimal due to the lack of them in the vicinity of the proposed facility. Additionally, sufficient depth and flow parameters at the site should result in rapid dispersion of waste. Small daily loading rates of discharged pollutants are anticipated due to the small fish biomass being reared. This coupled with a wide dispersal of discharged solids limits impacts to seagrasses.

5.6 Social and Economic Environment

The following sections focus on the proposed action impacts on four primary areas: aquaculture production, commercial and recreational fishing, human health/public health, and environmental justice.

5.6.1 Aquaculture Production

The Gulf Region within state waters or inland is a major aquaculture producer. Freshwater aquaculture far exceeds marine aquaculture and pond aquaculture, which is the most popular method. Nonetheless, marine aquaculture production in Gulf state waters and inland has been increasing. Because Almaco jack is not a commercially targeted species and is not a substitute for the Gulf's freshwater finfish production (Sections 3.4.2 Commercial Marine Aquaculture Production, 3.4.3 Commercial Landings of Almaco Jack, 4.4.1 Commercial Marine Aquaculture Production and 4.4.2 Commercial Fisheries) cumulative impacts from the proposed facility are expected to be minimal.

5.6.2 Commercial and Recreational Fishing

The proposed action alternative is expected to have minimal impacts on commercial and recreational fishing that may occur in the vicinity of the facility. Fishermen are expected to maintain a safe operating distance from the site, as trolling too closely may result in the loss of expensive fishing lures and other gear. With respect to safety and vessel operations, the risk of gear entanglements or collisions with the feed barge, mooring line, or tethers are not expected.

One factor directly related to the proposed action that could impact commercial and recreational fisheries around coastal fish farms are the discharges of dissolved and particulate inorganic and organic nutrients into the water column and discharges of total solids deposition and organic enrichments to seafloor sediments from uneaten feed and fish feces. The area chosen for the proposed activity has depth and current flow parameters that should result in rapid and broad dispersion of solid wastes discharged from the facility. Due to the small fish biomass (74,800 lbs. produced during a 280-day fish production cycle) in the single cage facility and current flows measured in the vicinity of the selected site, impacts on water quality as it relates to commercial/recreational fishing is expected to be minimal. To put the proposed facility in perspective, the average annual catch of a single fishing ship in the U.S. is 40,000 metric tons (or the equivalent of 88,184,920 lbs.) (Stupachenko, 2018).

The rapid development of marine aquaculture around the world has raised concerns over the possible genetic and ecological impact of escaped fish on natural populations. Potential effects include genetic modification and reduced fitness, competition for food and space, introduction or spread of diseases and parasites, and predation on native stocks. Intentional releases for stock replenishment or stock enhancement may have positive or negative effects on natural populations by increasing stock size and abundance. Additionally, the effects of accidental releases by species or number may or may not have negative effects. The effect depends on the genetic state of the escaped cultured fish as well as the numbers and mean individual size of the escaped population.

Some commercial fishermen are concerned that aquaculture will negatively affect prices for wild harvest in the U.S. through increased supply (Rubino, 2008). Competition in seafood markets will exist with or without domestic aquaculture. The U.S. cannot meet consumer seafood demand through wild caught fishing activities alone, and seafood imports and other forms of protein (such as chicken and beef) already provide significant competition. One reference source (Anderson & Shamshak, 2008) explains that even if potential offshore aquaculture species are not raised domestically, the importation of these and other aquaculture species will continue, and most likely increase, as the forecasted gap between supply and demand for seafood widens.

5.6.3 Human Health/Public Health

Bioaccumulation of contaminants in fish represent minimal cumulative impacts based on the relatively small fish biomass proposed by the applicant. The potential adverse impacts to seafood quality would be minimized by rapid dilution of dissolved wastes and dispersion of solid wastes discharged from the facility, fishery management controls (Sections 3.2.1.3 and 4.2.1.1 Pharmaceuticals), and permit conditions. Permit conditions that avoid or minimize potential adverse impacts to commercial and recreational fisheries are the same requirements that would address human health concerns. Therefore, it is not considered that potential impacts to human health from the activities proposed under this EA would be significant.

5.6.4 Environmental Justice

Disproportionately high and adverse human health effects on EJ communities are not expected from the permitted proposed action. Impacts on human health/public health related to farm fish quality and landings have been discussed in the Human Health (Section 4.4.4) and Environmental Justice (Section 4.4.5) sections.

6.0 Summary of Alternatives

6.1 Alternatives Summary

As discussed in *Section 2.0 Alternatives*, the EPA and the USACE are considering two alternatives for the proposed VE project in this EA. Alternatives considered include a No-action alternative and an action alternative, issuance of a NPDES permit and USACE Section 10 permit for the facility.

6.1.1 Alternative 1: No Action

Under the no-action alternative the EPA would not issue the NPDES permit and the USACE would not issue a Section 10 permit for the proposed VE project. The effects of the no action alternative would be as described in Chapter 3, Affected Environment, in which no structures or pens would exist at the site location.

6.1.2 Alternative 2: Proposed Action--Issuance of NPDES Permit and Section 10 Authorization for Velella Epsilon

Under Alternative 2, the EPA would issue a NPDES permit and the USACE would issue a Section 10 permit for the proposed VE project. Below provides a summary of the permit conditions that will be included in the NPDES permit and Section 10 permit:

EPA NPDES Permit

The proposed permit would include monitoring conditions and limitations that are based on the previous NPDES permits and the BPJ of the permit writer. These permit conditions will be consistent with the Clean Water Act (CWA) Section 308, Section 312, Section 402, and Section 403, and 40 CFR Section 125 and the concentrated aquatic animal production facilities regulations at 40 CFR Section 122.24 and 40 CFR Part 451. While 40 CFR Part 451 applies to facilities which meet the CAAP definition, and is not directly applicable to the proposed facility which does not meet the production thresholds of the CAAP definition, the NPDES permit for the proposed facility will apply the effluent guideline limitations of 40 CFR Part 451 based on the BPJ of the permit writer and the factors in 40 CFR Part 125, Subpart A.

The aquaculture-specific water quality conditions contained in the NPDES permit will generally include an environmental monitoring plan and effluent limitations expressed as BMPs. The environmental monitoring plan is included to examine the effects of the facility's discharges on surrounding ecosystem. The environmental monitoring plan is based upon 40 CFR Section 125.123(d). The proposed NPDES permit includes water quality monitoring (feed rate, pH, dissolved oxygen, chlorophyll a (chl-a), temperature, nitrogen, phosphorus, turbidity, drugs, and total ammonia nitrogen), sediment monitoring, and benthic macroinvertebrate sampling. The permit also includes the prohibitions on the discharge of solid materials. The BMP Plan will require implementation of practices intended to meet the effluent limit guidelines established for the Concentrated Aquatic Animal Production Point Source Category (40 CFR Section 451).

The permit also requires development and implementation of a facilities damage control plan to prevent and contain facilities damages due to man-made and natural disasters. As part of the plan, the permittee

will be required to identify equipment and implement procedures to be used to prevent and contain the facility's damages due natural disasters and storm events. The requirement for the plan is included based upon the BPJ of the permit writer. The permit also requires development and implementation of a spill control plan to prevent and control spills of toxic or hazardous substances listed under CWA Section 307(a) and Section 311 that may reach surface waters. The permittee will be required to identify any toxic chemicals used at the facility.

USACE Letter of Permission (LOP)

The proposed USACE LOP would include special conditions protecting general navigation of the area, requirements for implementation of a tracking system for the net pen, adherence to the proposed Marine Mammal, Sea Turtle, and Seabird Monitoring and Data Collection Plan (Protected Species Plan), and other notification and compliance requirements, as deemed appropriate.

6.2 Comparison of Alternatives

The basic difference between the alternatives are action versus no action. Alternative 1 represents the baseline conditions of the project location without an offshore aquaculture project being located at the project site. The action alternative (Alternative 2) represents authorizing Kampachi Farms to install aquaculture pens at the project location and allows discharges associated with the operation of these pens. The anticipated impacts associated with Alternative 2 include relatively minimal impacts to physical, biological, socioeconomic resources. The EPA and USACE believe the VE NPDES and Section 10 permit, Alternative 2, will have adequate provisions to avoid or minimize potential significant environmental impacts.

6.3 Preferred Alternative

EPA and the USACE have selected Alternative 2 as the preferred alternative. The major difference in the alternatives is one represents the no action, Alternative 1, and one represents issuance of the proposed NPDES and Section 10 permits, Alternative 2.

The proposed NPDES Individual Permit and Section 10 permit for the VE project, Alternative 2, contains provisions that are sufficiently protective of the marine waters and resources of the Gulf. As long as Kampachi Farms complies with the proposed Individual Permit and Section 10 permit requirements, the EPA and the USACE do not expect the discharges from the facility or the construction of the facility to materially degrade the environmental resources of the Gulf. In addition, the proposed EPA Individual Permit, Alternative 2, has a re-opener provision that authorizes EPA to modify the NPDES permit as necessary in response to new information demonstrating the provisions of the proposed Individual Permit are inadequately protective of marine resources of the Gulf.

6.4 Unavoidable Adverse Impacts

The NPDES individual permit discharges from the proposed VE project are expected to have unavoidable minor impacts, primarily in the vicinity of the proposed project. For the most part, these impacts would be short-term in nature, limited in spatial extent, and expected to have a low likelihood to result in cumulative impacts. The potential impacts of authorized effluent discharges are controlled

through effluent discharge limits, the restricted use or prohibited use of substances contained in authorized waste streams, and best management plans.

Notwithstanding the possibility of these unavoidable adverse impacts, EPA had determined that, based on the findings of the ODCEs for the previous NPDES Individual Permits, the issuance of the proposed NDPES Individual Permit for VE project will not result in unreasonable degradation of nor irreparable harm to the marine environment of the Gulf of Mexico with all permit terms, conditions, and limitations in place. The ODCE for this proposed Individual Permit has the same findings.

6.5 Irreversible and Irretrievable Commitments of Resources

The National Environmental Policy Act Section 101 (2)(c)(v) requires a detailed statement on any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented. Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the use of those resources have on future generations. Irreversible commitments of resources are those that cannot be reversed except over an extremely long period of time. These irreversible effects primarily result from destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

The proposed action would constitute an irreversible or irretrievable commitment of non-renewable or depletable resources, for the materials, time, money, and energy expended during activities implementing the proposed action. Under the no-action alternative, there would be no irreversible and irretrievable commitments of resources. Irreversible and/or irretrievable impacts for the proposed action are noted below.

Consumption of fossil fuels and energy would occur during buildout of the aquaculture pens and operation activities. Fossil fuels (gasoline and diesel oil) would be used to power support vessels and generators. The energy consumed for project construction and operation represents a permanent and non-renewable commitment of these resources.

Materials for construction of new facility would be irretrievably committed for the life of the project. Use of these materials represents a further depletion of natural resources. Construction and maintenance activities are considered a long-term non-renewable investment of these resources.

Impacts to the sea bottom are expected to be temporary and are not expected to be an irreversible and irretrievable resource commitment, however access to the area around and the facility may be limited during the life of the project. There would also be commitment of time and money for the planning, permitting, and implementation of the proposed project.

6.6 Relationship Between Short-term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The short-term uses of the environment that are considered in the EA include the water column and discharges of total solids. Issuance of an NPDES individual permit and Section 10 permit for VE project and the other cumulative activities in the Gulf, are compatible with the maintenance of long-term productivity in the Gulf. Any unavoidable adverse impacts associated with the proposed activity are anticipated to be primarily short-term and localized in nature.

6.7 Preliminary Finding of No Significant Impact (FONSI)

Consistent with 40 CFR §1508,13, the EPA has determined that the proposed action (issuance of an NPDES permit, Alternative 2) will not cause a significant impact on the environment as outlined in this draft EA. The issuance of the NPDES permit to the applicant will not cause a significant environmental impact to water quality or result in any other significant impacts to human health or the natural environment. The EPA is making this preliminary FONSI available to the public in accordance with 40 CFR Section 6.203 before finalizing our permit decision. See *Appendix G*.

7.0 Other Protective Measures and Agency Coordination Efforts

The proposed permit and authorization include several conditions, terms, and provisions that are protective measures against potential environmental consequences of the proposed action. The EPA and USACE has consulted multiple federal and state agencies for the proposed project. These additional consultation and coordination efforts include the following:

- State CZMP consistency
- National Historic Preservation Act
- The Wild and Scenic Rivers Act
- The Fish and Wildlife Coordination Act
- ESA Consultation
- EFH Consultation
- Consideration of CWA Section 401
- MMPA Coordination

7.1 State Coastal Zone Management Program Consistency

Coastal Zone Management Act (CZMA), 16 U.S.C. 1451 et seq. was enacted to protect the Nation's coastal zone and is implemented through state-federal partnerships. Section 307(c) of CZMA prohibits the issuance of NPDES permits for activities affecting land or water use in coastal zones unless the permit applicant certifies that the proposed activity complies with the state coastal zone management program.[11]

Issuing a NPDES permit and Section 10 authorization for the VE project is a federal action that requires compliance with the CZMA, therefore the applicant is required to certify that their proposed project complies with the State of Florida's Coastal Zone Management Program. On February 25, 2019, the applicant received CZMA concurrence from the State of Florida for the proposed project. Agency coordination letters and correspondences related to CZMA are provided in *Appendix H*.

7.2 National Historic Preservation Act (NHPA)

Under 16 U.S.C. 470 et seq. Section 106 of the Act and implementing regulations (36 CFR Part 800) require the Regional Administrator, before issuing a license (permit), to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places. The Act's requirements are to be implemented in cooperation with state historic preservation officers and upon notice to, and when appropriate, in consultation with the Advisory Council on Historic Preservation.

During the permitting process for the proposed project the applicant coordinated with the State Historic Preservation Office (SHPO) in Florida to ensure compliance with NHPA. In a letter dated February 8,

[11] Cited from https://www.epa.gov/npdes/other-federal-laws-apply-npdes-permit-program

2019, the SHPO provided concurrence that the project will have no effect on historic properties. Agency coordination letters and correspondences related to NHPA are provided in *Appendix H*.

7.3 The Wild and Scenic Rivers Act

Under 16 U.S.C. 1273 et seq. Section 7 of the Act prohibits the Regional Administrator from assisting by license or otherwise the construction of any water resources project that would have a direct, adverse effect on the values for which a national wild and scenic river was established. The proposed project selected site is located on the west Florida Shelf, approximately 45 miles west, southwest of Longboat Pass-Sarasota Bay, Florida in federal waters. It is not expected that this project will impact any wild and scenic rivers.

7.4 Fish and Wildlife Coordination Act

Under 16 U.S.C. 661 et seq. - the Regional Administrator, before issuing a permit proposing or authorizing the impoundment (with certain exemptions), diversion, or other control or modification of any body of water, consult with the United States Fish and Wildlife Service, Department of the Interior, and the appropriate state agency exercising jurisdiction over wildlife resources to conserve those resources.

The EPA has coordinated with the FWS to ensure compliance with the Fish and Wildlife Coordination Act. The EPA invited thee FWS to participate as a cooperating agency for the development of this EA for the proposed project on November 7, 2018. Agency coordination letters and correspondences related to Fish and Wildlife Coordination Act are provided in *Appendix H*.

7.5 Section 7 ESA Coordination

16 U.S.C. 1531 et seq. Section 7 of the ESA requires that federal agencies consult with the ESA administering services to ensure that any projects authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

The EPA is communicating with FWS and NMFS to coordinate on endangered species. The consultation letters are included in *Appendix D* of this EA. The EPA is submitting this EA and the Biological Evaluation document, included as *Appendix D*, to the 'Services' for their review. In preparing the EA, the EPA and USACE have made the determination that its preferred alternative "may affect, but not likely to adversely affect" listed species, critical habitat, or proposed species and proposed critical habitat under the jurisdiction of NMFS. Additionally, the EPA and USACE have made the determination that its preferred alternative will have "no effect" on listed species, critical habitat, or proposed species and proposed critical habitat under the jurisdiction of FWS. The EPA will carefully consider all comments from these agencies regarding ESA protected species in developing the final permit and the finding of no significant impact (FONSI).

7.6 Essential Fish and Habitat Consultation

Essential Fish Habitat Provisions of the Magnuson-Stevens Act - EFH promotes the protection of essential fish habitat in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. EFH requires that the EPA consult with the NMFS for any EPA-issued permits which may adversely affect essential fish habitat identified under the Magnuson-Stevens Act.

An EFH assessment was prepared by the EPA and the United States Army Corps of Engineers (USACE). On March 8, 2019, the EPA provided the EFH assessment to the NMFS and initiated abbreviated consultation with the NMFS. On March 12, 2019, the NMFS concurred with the EFH determination made by the EPA and the USACE. After completion and concurrence of the assessment, minor changes were made to the EFH document, though the updates did not change the findings of the assessment. On August 2, 2019 EPA provided the updated EFH assessment to NMFS for concurrence. Consultation with NMFS on these changes will occur during the public comment period (See Appendix E).

7.7 CWA Section 401

Under Section 401 of the Clean Water Act, a federal agency cannot issue a permit or license for an activity that may result in a discharge to waters of the U.S. until the state or tribe where the discharge would originate has granted or waived Section 401 certification. Section 401 certification provides states and authorized tribes with an effective tool to help protect state or tribal aquatic resources. The state or tribe in which the discharge originates, in exercising Section 401 certification authority, decides whether the licensed or permitted activity will be consistent with certain CWA provisions, including the state or tribe's water quality standards. The state or tribe may grant, condition, deny or waive certification. Under Section 401(d), the licensing or permitting agency must include in the license or permit any conditions identified by the state or tribe as necessary to ensure compliance with the relevant CWA provisions as well as appropriate requirements of state or tribal law.

The proposed facility is located approximately 45 miles west, southwest of Longboat Pass-Sarasota Bay, Florida. For purposes of the CWA, state waters extend three miles from shore. Accordingly, CWA Section 401 certification is not required because the proposed discharge does not originate in any state or tribal waters.

In addition to the state or tribal certification requirement for the state or tribe in which the discharge originates, Section 401 of the CWA also requires the EPA, if a proposed discharge may affect the quality of the waters of any other state or tribe (e.g., if the discharge may affect waters of a state or tribe that is nearby or downstream from the state or tribe in which the discharge originates), to notify such other state or tribe. The state or tribe, so notified, then has an opportunity to submit its views or objections to the proposed license or permit, and to request a public hearing. While the EPA is obligated to condition any permit on compliance with the water quality standards of any affected state or tribe, in the case of a nearby or neighboring state or tribe, it is not required to adopt any conditions requested by the state or tribe. In this case, the EPA has determined, based on a review of the application and other relevant information, including the location and nature of the proposed discharge, that the proposed discharge will not affect the water quality of any neighboring state or tribal waters.

7.8 Marine Mammal Protection Act

The Marine Mammal Protection Act established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees, and dugongs.

Part of the responsibility NOAA Fisheries has under the MMPA involves monitoring populations of marine mammals to ensure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted," and a conservation plan is developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries, and studies of pinniped-fishery interactions.

Under Section 118 of the MMPA, NOAA Fisheries must publish, at least annually, a List of Fisheries that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The categorization of a fishery in the List of Fisheries (LOF) determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements.

Currently, the applicant is assisting by partnering with NMFS SERO to develop a marine mammal monitoring plan to collect data to better inform the risks associated with this type of aquaculture operation to marine mammals and, thus, help determine how better to categorize this type of aquaculture operation on future LOF. The applicant will carry onboard a current MMAP certificate (Southeast MMP Authorization Certificate 2019 https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-authorization-program) and report any marine mammal injuries to NMFS within 48 hours to comply with Section 118 of the MMPA.

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9.0 Public Notice

The EPA will be providing the public an opportunity to review and comment on this EA during a 30-day public comment period. The notice of availability for the EA will be published in both the Sarasota – Herald Tribune and on EPA's website at https://www.epa.gov/aboutepa/about-epa-region-4-southeast.

Copies of the EA along with a copy of the draft NPDES permit can be downloaded from the above referenced website.

10.0 Preparers

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Appendix A –Baseline Environmental Survey
Appendix B – Cage/Pen Design
Appendix C - ODCE
Appendix D – ESA Consultation Documents
Appendix E – EFH Consultation Documents
Appendix F – CASS Technical Report
Appendix G – Preliminary Finding of No Significant Impact
Appendix H - State Consultations (Section 106/CZMA)