



**Ventura Shellfish Enterprise:
Strategic Permitting Initiative to Substantially Increase
Shellfish Farming in Southern California
2015 NOAA Sea Grant Aquaculture Extension and
Technology Transfer
Task I Deliverable: Strategic Permitting Plan
(Federal Waters Alternative)**

JANUARY 2018

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
BA	Biological Assessment
BE	Biological Evaluation
BMP	best management practice
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
Corps	U.S. Army Corps of Engineers
CZMA	Coastal Zone Management Act
EIR	environmental impact report
EMB	Environmental Management Branch
ESA	Endangered Species Act
FDB	Food and Drug Branch
MND	mitigated negative declaration
ND	negative declaration
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSSP	National Shellfish Sanitation Program
NWP	nationwide permit
OHP	Office of Historic Preservation
PATON	Private Aids to Navigation
RWQCB	Regional Water Quality Control Board
SLC	California State Lands Commission
SWRCB	State Water Resources Control Board
USFWS	U.S. Fish and Wildlife Service
VPD	Ventura Port District
VSE	Ventura Shellfish Enterprise

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INTRODUCTION

After completion of the Task 1 Strategic Permitting Plan and regulatory feedback on the document, the Ventura Port District (VPD) and VSE volunteers engaged local stakeholders in a series of site selection workshops accompanied with the use of University of California-Santa Barbara's *SeaSketch* personnel and platform. The VSE team reached out to over 500 commercial fishing vessel owners from Goleta to Port Hueneme to consider specific growing locations within the candidate area. The VPD Board and public received updates at several VPD meetings dating back to July 2017 about this on-going process through the VSE website venturashellfishenterprise.com and public meeting notices. The results of these efforts showed a variety of opinions both supportive of the project and a clear concern by local commercial fishermen for siting of the project in California Halibut trawl grounds. The candidate area overlaps these trawl grounds, making it difficult to site anywhere within the candidate area to fully alleviate these concerns.

Through the use of *SeaSketch*, the VSE team was able to evaluate potential growing areas adjacent to the candidate area but outside of the California State Halibut trawl grounds with similar benthic, growing and environmental conditions. This analysis led to a new alternative near the candidate area close to Ventura Harbor, that from an environmental impacts perspective, will be very similar in nature to sites identified within the candidate area. Following development of this new alternative, on November 15, 2017, the Ventura Board of Port Commissioners authorized the VPD General Manager to proceed with the preparation of applications for permits for the VSE project, using the new proposed site location in federal waters.

The new alternative will be at a similar depth, contain the same sandy substrate conditions, and trigger the same biological analyses and considerations. While the VSE team does not believe this project siting represents a material change from the project proposed in the Strategic Permitting Plan, its location in federal rather than state waters impacts the regulatory pathway, environmental review process, permitting, water quality testing and product testing required for the project. The VSE team has prepared this updated Strategic Permitting Plan to account for those changes.

The VSE has been in contact with NOAA-Seafood Inspection Program (NOAA-SIP) representatives who are currently developing an application process that establishes a pathway for the development of a sanitation plan for new shellfish aquaculture operations in federal waters. The VSE team is committed to working collaboratively with NOAA-SIP and other relevant federal entities on the development of a sanitation plan for a federal waters siting alternative. This is discussed further in Section 1.

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Federal Waters Alternative

Increasing the supply of safe, sustainably produced domestic seafood is a priority for NOAA and the Department of Commerce, as well as the State of California. In 2015, the VPD, in cooperation with the VSE, received a substantial sub-award from a \$300,000 NOAA 2015 Sea Grant Aquaculture Extension and Technology Transfer Grant to California Sea Grant in support of a strategic permitting and planning initiative to facilitate and substantially increase shellfish farming in Southern California. The project seeks to secure all required federal, state, and local permits and entitlements to support a commercial mussel farm in open federal waters proximate to Ventura Harbor, California (Project). The VPD received this 2015 Sea Grant award to support this innovative project creating and permitting leases for farming the Mediterranean mussel, *Mytilus galloprovincialis*. As a member of VSE, the VPD will hold all required federal, state, and local permits and entitlements.

The NOAA 2015 Sea Grant provides funding and support of three discrete tasks: Task 1 provides for a Strategic Permitting Plan. Task 2 provides for completion and submittal of all requisite permit applications along with analyses necessary and sufficient to comply with the National Environmental Policy Act (NEPA). Task 3 is an extension plan that includes two education and outreach components: (1) launch of an open-access project website and social media initiatives, and (2) a series of educational workshops that covers a broad spectrum of Project-related issues, including the need for safe and sustainable aquaculture, site selection, mussel growing technology and equipment choices, Project environmental effects and best management practices (BMPs), shellfish quality and safety assurance, economic projections and the process for becoming a Project shellfish grower/producer.

Task 1 of the NOAA Sea Grant provides funding to support a Strategic Permitting Plan. Chapter 1 of the Strategic Permitting Plan provides a detailed summary of the commercial mussel farm, which will consist of twenty 100-acre parcels to be located in the open federal waters proximate to Ventura Harbor, California. Chapter 2 identifies the necessary federal and state permits and approvals, including those that trigger review under NEPA. A focused summary of each of these approvals is provided, together with a permit review timeline and critical path elements. Chapter 3 provides the strategic plan to securing these approvals, along with a proposed permit schedule and critical permit path.

The Strategic Permitting Plan will allow for meaningful and early consultation with agency staff, as well as other stakeholders and the public. This in turn will ensure that Project permitting and land use analyses will be accurate and complete, and that the review of these materials will be efficient, thorough, and streamlined to the extent practical. It is also intended to support others in their independent efforts to secure approvals for similar commercial mussel projects in open waters off California's coast.

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1 PROJECT DESCRIPTION

1.1 Project Applicant

The Ventura Port District (VPD) is the project applicant. VPD is what is known as an Independent “Special District.” State law defines a special district as “any agency of the state for the local performance of governmental or proprietary functions within limited boundaries.” A special district is a separate local government entity that delivers public services. VPD is the owner/operator of the Ventura Harbor.

1.2 Project Summary

The Project will establish a commercial offshore bivalve aquaculture operation based from the Ventura Harbor to create economic opportunities for community and marine stakeholders, produce a high value and sustainable seafood product, and advance collaborative evaluation of permit applications among regulators.

The Project consists of twenty 100-acre plots in federal waters of the Santa Barbara Channel in sandy bottom areas located northwest of Ventura Harbor, as shown on Figure 1, Location of Project in Santa Barbara Channel. The sites will be used for growing the Mediterranean mussel (*Mytilus galloprovincialis*) via submerged long lines. The mussels will be grown and harvested by Project growers/producers and landed at Ventura Harbor. A portion of one plot will be set aside for research and education purposes.

Initial plantings of juvenile seed mussels, commonly referred to as spat, will be purchased from onshore hatcheries, certified by the California Department of Fish and Wildlife (CDFW). If approved by the appropriate regulatory agencies, subsequent plantings may include wild collected spat. At the hatcheries, mussels adhere directly to special textured ropes that promote mussel attachment and growth. These ropes will be suspended beneath the surface in open federal coastal waters of the Channel via lines and buoys anchored to the sandy bottom. Cultivated mussels grow by filtering naturally occurring phytoplankton from the ocean.

Harvesting involves separating the mussels from the ropes, followed by cleaning, sorting, and bagging. All of these activities will take place aboard the harvesting vessel. The bagged mussels will be transported to Ventura Harbor for offloading, sale, and distribution.

This Project will serve to diversify the catch and stabilize the fishing fleet home-ported at Ventura Harbor, provide a locally cultivated, sustainably raised food source, and significantly advance state and national goals and objectives for increased domestic aquaculture and a secure food supply.

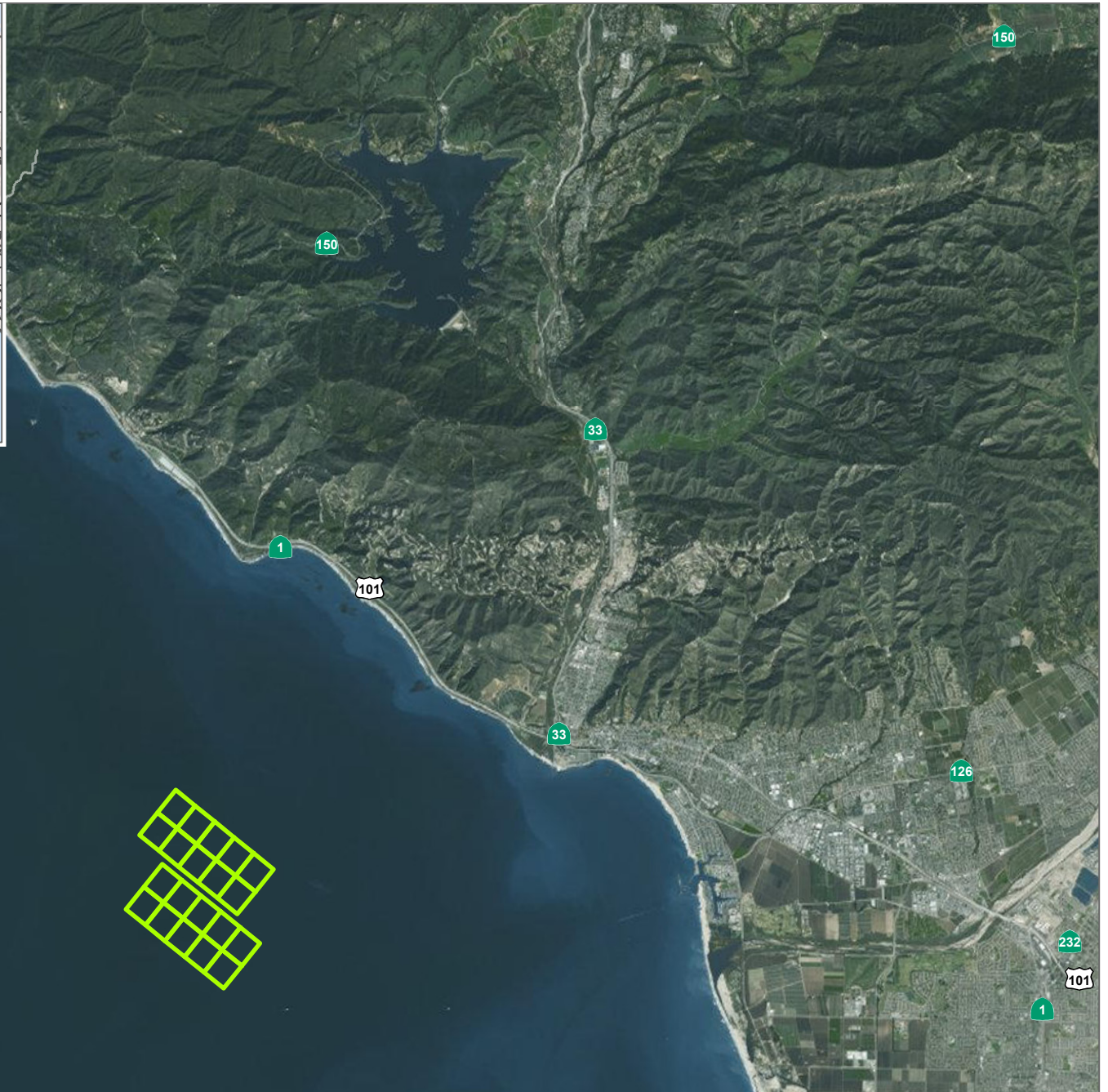
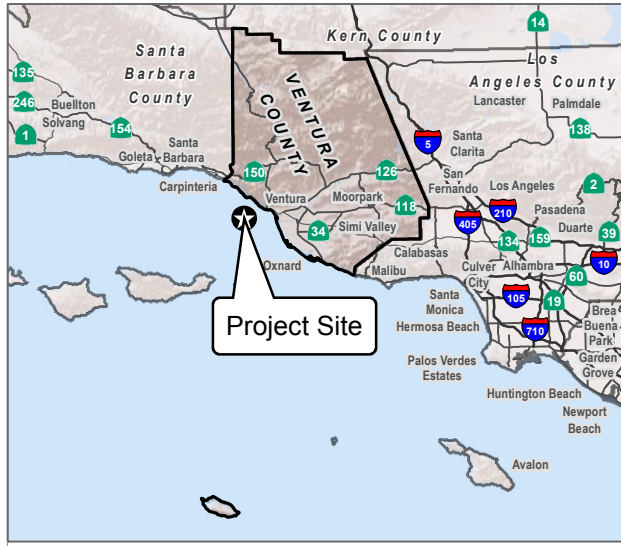
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This Project is supported, in part, through the NOAA Sea Grant program, the goal of which is to contribute to “a safe, secure and sustainable supply of seafood to meet public demand.”

The Project is a unique approach to developing environmentally and economically sustainable shellfish commerce with product landed at the Ventura Harbor. This initiative is novel in several ways. First, the Project proposes to produce bivalve shellfish in the offshore marine environment, cultivation practices that, although well-established worldwide, are in their infancy in the United States, particularly on the West Coast. Second, the Project is working cooperatively in an open-source format with state and federal regulators to establish a template for additional future shellfish growing operations in federal waters off the California coast. The proposal to permit a group of twenty 100-acre growing plots allows for participation in the Project by potential growers who might otherwise be precluded because of the significant regulatory burden of obtaining the required government approvals. The scale of the Project also allows the individual grower/producers to benefit from centralized environmental monitoring, product safety testing, and product marketing. This Project as it is scaled is also intended to bolster the working waterfront in Ventura Harbor, providing economic benefits to VPD, its tenants, and the community.

The Project offers a number of other benefits related to food supply, because at present the mussel market in the United States and locally is dominated by imports from Canada, Chile, New Zealand, and Europe. The Project will supply a locally grown mussel product to an established market with the potential for expansion. Cultivating mussels in federal waters off the California coast is also in keeping with federal policy to improve domestic food security. And at the same time, mussels provide a high-protein, low-fat source of human nutrition. Compared with other cultivated protein sources, mussels use far less of our limited freshwater resources.

The Project is consistent with California’s Aquaculture Development Act (California Public Resources Code, Sections 826–828), which encourages the practice of aquaculture to augment food supplies, expand employment, promote economic activity and protect and better use the land and water resources of the state, and Assembly Joint Resolution 43 (2014), wherein the State Legislature states its support “to protect existing shellfish beds and access to additional acreage for shellfish farming and restoration.” The Project is also consistent with NOAA’s National Shellfish Initiative (NOAA 2013) and National Marine Aquaculture Policy (NOAA 2011), which seek to increase populations of bivalves in coastal waters through commercial aquaculture production and acknowledge the multiple benefits of shellfish aquaculture, including providing new jobs and business opportunities, meeting the growing demand for seafood, and providing habitat for important species. Finally, the Project furthers the goals of the National Ocean Policy Implementation Plan (National Ocean Council 2013), one of which is to increase efficiencies in the permitting process and encourage agency coordination to facilitate additional marine aquaculture development.



SOURCE: NAIP 2016

FIGURE 1
Project Location
Ventura Shellfish Enterprise

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1.3 Project Objectives

It is widely recognized that the U.S. needs to boost domestic seafood production. At present there is only one commercial aquaculture operation in federal waters off the California coast. The current low level of production is partially due to the existence of significant regulatory and statutory barriers to commercial shellfish production, especially for small businesses. Numerous sources provide extensive lists of permits and entitlements required to initiate commercial shellfish operations. However, there is widespread recognition that these lists do not adequately prepare stakeholders for the broad and complex array of technical and bureaucratic hurdles inherent to the approval process, e.g., site selection criteria; compliance with National Shellfish Sanitation Program (NSSP) sanitation protocols; selection of optimal gear; and critical paths for securing approvals. Given the time and financial burden presently needed to secure approvals which can exceed three to four years and is often cost prohibitive, there is an obvious need to develop a viable and replicable model that facilitates the approval pathway for prospective shellfish grower/producers. The VPD will apply for a set of master permits. Individual operators would then be assigned pre-permitted areas from VPD.

The overall VSE objectives are for VPD to obtain entitlements for twenty, 100-acre shellfish aquaculture permits in Federal waters of the Santa Barbara Channel; establish best management practices for commercial fisherman sub-permits, coordinate comprehensive monitoring and reporting for all permits, and leverage existing underutilized onshore facilities at Ventura Harbor for processing and shipping the sub-permittees' shellfish product. The project objectives outlined below and detailed more thoroughly in this Section necessitate the proposed project scale which will contribute significantly toward overcoming the identified barriers to new aquaculture operations, promote additional mussel cultivation through VSE, and will address federal priorities as expressed through Sea Grant to significantly advance sustainable domestic aquaculture. Likewise, the project is in alignment with the Sea Grant to contribute to "a safe, secure and sustainable supply of seafood to meet public demand."

1. To increase the supply of safe, sustainably-produced, and locally-grown shellfish while minimizing negative project impacts

The Project responds to federal and state priorities to increase the supply of safe, sustainably produced domestic seafood.

California is the third-largest consumer of shellfish in the United States, and current state production lags far behind demand. Shortfalls are met by importation, which contributes to the state and national seafood deficit and increases our carbon footprint by the need to transport shellfish into the state from around the world. The Project at buildout would produce 9,000 to

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11,000 tons of mussels for market per year. Further, per Objective 3, by serving as a template for additional offshore shellfish-growing projects, this Project aims to increase the efficiency of shellfish permitting and thus bring additional shellfish growing operations online in federal waters off the California coast.

Shellfish aquaculture is environmentally sustainable relative to other forms of animal protein in the human diet (see Table 1). Mussel production requires no feed and very little freshwater, and it uses ocean areas rather than land for production. Shellfish cultivation cleans ocean water of pollutants from land-based agriculture (e.g., nitrogen and phosphorous), and mussels are a low-carbon footprint food product compared to other sources of animal protein.

Table 1
Comparison of Sustainability Indicators among Animal Production Systems

Animal Type	Food Conversion (kg feed/kg edible weight)	Protein Efficiency (%)	Nitrogen Emissions (kg/ton protein produced)	Phosphorous Emissions (kg/ton protein produced)	Land (tons edible product per HA)	Consumptive Freshwater Use (m3/ton)
Beef	31.7	5	1,200	180	0.24–0.37	15,497
Chicken	4.2	25	300	40	1.0–1.20	3,918
Pork	10.7	13	800	120	0.83–1.10	4,856
Finfish (average)	2.3	30	360	48	0.15–3.70	5,000*
Bivalve mollusks	Not fed	Not fed	-27	-29	0.28–20	0

Source: Aquaculture Workshop 2015.

Notes: kg = kilogram; HA = hectare; m3/ton = cubic meters per ton.

* Consumptive water use is difficult to compare across finfish aquaculture production systems because of variability in feed sources and depending on whether the system is freshwater or saltwater.

To minimize conflicts with other ocean uses and ensure location away from pollution sources, the Project location was selected using a marine spatial planning tool developed at the University of California, Santa Barbara, and described further in Section 1.4, Project Location.

2. To enhance and sustain Ventura Harbor as a major west coast fishing port and support the local economy

The VPD, which owns and operates Ventura Harbor, will receive revenues and landing fees for mussels brought to the harbor for off-loading plus ancillary economic benefits of having producer/farmers based at the harbor. These new funds will assist the VPD in continuing to meet its mission, which includes providing a safe and navigable harbor and a seaside destination that benefits residents, visitors, fisherman, and boaters with harbor facilities, events, and services.

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The Project will also serve to diversify the catch and stabilize the fishing fleet home-ported at Ventura Harbor. Project participation opportunities may be available for existing local commercial fishermen based in Ventura Harbor, existing commercial shellfish businesses, and startups. The Project will employ specific outreach efforts to target small businesses and encourage their participation in the project.

Additionally, Ventura Harbor depends upon the U.S. Army Corps of Engineers (Corps) for annual dredging. There is a strong nexus between the continued receipt of federal support and the vitality of the harbor's commercial fishing operations and landings.

The Project as proposed will positively impact the economic health of the Ventura Harbor community through revenues and direct landing values, indirect secondary benefits, and economies of scale built into the project design.

Cultivated mussels landed by the Project will contribute significantly to the economic base of commercial seafood landings at Ventura Harbor. Each of the 20 proposed growing areas will accommodate an estimated 36 longlines. Each of these longlines is designed to support 8,000 feet to 10,000 feet of growing line, which in turn can produce 4 pounds of harvest size mussels per foot of line, or 32,000 – 40,000 pounds of harvest mussel per longline. It is reasonable to project each parcel producing 900,000 to 1,100,000 pounds of market-size mussels per year with a dockside wholesale value of \$2.25 million to \$2.75 million at current market rates of \$2.50 per pound. Therefore, at full cultivation of all 20 sites, 18 million to 22 million pounds of high-value, sustainably produced mussels with a value of \$45 million to \$55 million could be landed and distributed from the Ventura Harbor. Many factors will ultimately determine actual value including project size, growing conditions, operational considerations, time period to full build out, market conditions, project and operational costs, etc. In applying a factor of 50% to these preliminary estimates, the project could still potentially generate \$22.5M - \$27.5M in annual wholesale value.

Secondary economic benefits may include but are not limited to: direct retailing of mussel product within the harbor seafood restaurants and retailers; commercial boatyard activity related to maintenance of a producer vessel fleet; storage sales and maintenance of producer gear; secondary contracts related to installation and maintenance of mussel lines; and indirect benefits related to the tenancy of producers and support industry associated with the Project.

3. To provide economies of scale and technical support to small producers who would not otherwise be able to participate in shellfish aquaculture

Designed economies of scale will maximize the previously described direct and indirect secondary benefits of the Project. Significant expenses are associated with permitting,

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environmental review, compliance with shellfish health regulations, and environmental monitoring; therefore, leasing and permitting the Project as one will provide economies of scale and eliminate a significant impediment to market diversification and participation by small shellfish companies or new investors. This is one of the central organizing components of the Project: 20 separate production parcels are pre-permitted within the umbrella of the larger project, and the parallel operation of these parcels will create operating efficiencies. By permitting all the growing areas as a single Project, individual growers/producers benefit from the collective upfront permitting effort of VPD.

At the inception of the VSE project, no pathway existed for compliance with the National Shellfish Sanitation Program (NSSP) guidelines for shellfish grown in federal waters. There is now a pathway forward through collaborative development with NOAA-SIP. In January 2017, NOAA-SIP, in collaboration with the Food and Drug Administration (FDA), began the process of developing NSSP-compliant sanitation protocols for bivalve shellfish cultivated in federal waters. This process culminated in a conditionally approved series of protocols that are now being implemented by another federally permitted aquaculture project in southern California that is undergoing additional refinement. The protocols cover both pre- and post-harvest elements of the NSSP Model Ordinance. These protocols can serve as a template for further adaptation to the VSE project goals and needs. Such adaptations will take into consideration the public-private nature of the VSE enterprise, the participation of multiple grower-producers, its scale and ultimate location, and other factors. In consultation with the FDA and California Department of Public Health (CDPH), NOAA-SIP representatives are currently developing an application process that establishes a pathway for the development of a sanitation plan for new shellfish aquaculture operations in federal waters. The VSE team is committed to working collaboratively with NOAA-SIP and other relevant federal entities on the development of a sanitation plan for a federal waters siting alternative. VSE is also committed to establishing a centralized, federally approved, Ventura Harbor-based testing facility approved by CDPH to meet the testing requirements articulated in the sanitation plan. This process can be initiated independently of the sanitation plan and concurrently with the permit application process.

Thus, Project growers/producers will have access to a pooled, centralized and comprehensive shellfish sanitation, monitoring and reporting program for all the growing plots. The costs to the grower/producer associated with ongoing water quality sampling and monitoring will be reduced by the efficiency of a centralized pooled program, which will in turn reduce operating cost and increase the direct benefit to the grower/producer.

Further, growers/producers will also have access to technical expertise and the accepted best management practices (BMPs) developed through the permitting process. Similarly, Project

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grower/producers will enjoy access to centralized marketing and branding of a Ventura-specific premium seafood product grown and harvested in the Project area.

Each of these elements of the Project design contributes cumulatively to a total package, which in turn contributes positively, and materially to the ongoing operational health and vitality of the Ventura Harbor community.

4. To provide an entitlement and permitting template for aquaculture projects state-wide

A major goal of the Project is delineation of a streamlined strategic permitting pathway that will not only facilitate the establishment of a Ventura Harbor-based shellfish operation promoting sustainable economic development, but that will more generally serve as a model to help other entities address regulatory barriers and planning challenges that currently create impediments to the expansion of the shellfish aquaculture industry in federal waters off the California coast.

The Project seeks to significantly improve the interagency review and permitting process for offshore shellfish aquaculture and create a comprehensive and efficient permitting process that is cost effective for both review agencies and applicant alike. In doing so, the overarching Project objective is to establish a viable and replicable permitting pathway model that satisfies the requirements of the review and permitting agencies and may be used by any prospective shellfish growers/producers to facilitate project design and aid in the evaluation of future offshore aquaculture proposals.

5. To enhance public knowledge and understanding of sustainable shellfish farming practices and promote community collaboration in achieving VSE objectives

Realizing the vision of an improved permitting process requires coordinated planning among all stakeholders to attain the full environmental and economic benefits. VPD and other VSE partners are committed to transparency, open communication, and comprehensive public education and outreach efforts. To this end, VPD and other VSE partners will host an ongoing series of informational public meetings to discuss the social, economic, environmental, scientific, and technological variables encompassed by the Project. These interactive, workshop-style meetings will provide a forum for open dialog among all interested members of the general public, state and federal agency representatives, shellfish industry leaders, and environmental and scientific leaders to discuss the policy, planning, and scientific issues surrounding the establishment of a Ventura Harbor-based offshore shellfish aquaculture operation. This is a critical first step toward productive collaboration and ultimately, overall Project success.

It is also anticipated that some of the permitted shellfish areas, in particular the research and education plot, will be used as open-water classrooms for local students and the public to educate students and the public about shellfish aquaculture practices and benefits through field trips and guided tours.

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6. To advance scientific knowledge and state of the art aquaculture practices through research and innovation

The project is envisioned to include both research and education components. The project includes as partners researchers and educators with the following institutions:

- University of California, Santa Barbara, Bren School of Environmental Science and Management
- University of California, San Diego, Scripps Institution of Oceanography
- Woods Hole Oceanographic Institute

The project will serve as an in situ working laboratory for improving shellfish aquaculture techniques and will be used as an open-water classroom.

1.4 Project Location

Project growing plots will be located in open federal waters northwest of Ventura Harbor. The Project is proposing twenty 100-acre growing sites occupying a total Project area of 2,000 acres. A portion of one site will be set aside for research and education purposes. The project location has been altered from the location presented in the previous version of this document. The initial area of interest, or candidate area, was 18,533 acres in state waters. As a result of public comments received by stakeholders during VSE's public outreach efforts, the VSE team expanded its site search to include areas in federal waters proximate to Ventura Harbor. This area is generally located between the Ventura Harbor entrance and the Ventura County–Santa Barbara County line to the north and south and a depth of between 85 and 120 feet. The specific location of the 20 individual 100-acre growing parcels was developed collaboratively with regional marine stakeholders in recognition of the need for the project area to accommodate multiple interests and natural functions. In addition to the 20 growing sites that will be identified for operation, potential alternative growing sites will likely be considered by the U.S. Army Corps of Engineers (Corps) as part of its independent analysis of the proposed project.

Successful shellfish projects depend foremost on location in an appropriate growing area. In order to identify the original candidate area, the Project used methodology developed at the University of California, Santa Barbara, Bren School for Environmental Science and Management for quantitative marine spatial planning specific to the needs of shellfish aquaculture (Lester et al., in press). This methodology was used to evaluate the marine environment adjacent to the Ventura Harbor. This model mapped the marine environment with respect to suitability for a shellfish operation using stacked layers of mapping data. Areas constrained for use, such as navigation pathways, Marine Protected Areas, areas of hard rocky

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bottom representing essential fish habitat (EFH), oil and gas leases, and existing infrastructure such as telecommunication cables and municipal wastewater discharge pipelines, were identified and these areas removed from consideration. Biological and abiological ocean data layers of temperature, chlorophyll concentration, and current were applied to remaining areas as a proxy for shellfish production suitability. New maps with finer resolution created candidate zones, which were evaluated for suitability as a Project site with respect to proximity to Ventura Harbor, known bathymetric survey data, minimization of interaction with recreational traffic and activities, and total site contiguity.

The proposed project site meets all of the above criteria for successful bivalve shellfish aquaculture and does not interact with constraints. The described area is a gradually sloping sandy/soft bottom ideal for the installation of sand screw mooring systems, which are the preferred method for deployment, removability, and holding power necessary for offshore mussel cultivation.

The marine spatial planning model (Lester et al., in press) further described a trade-off analysis used to create a tool for opportunities lost due to the siting of a shellfish aquaculture project and to quantitatively weigh those potential losses against potential gains from shellfish aquaculture. The primary identified area of concern associated with potential use conflicts was interaction with commercial fishing. Through analysis of fish landing data by harbor, gear type, and by fishing area (block), a possible interaction with the halibut trawl fishery was identified; all other landed species activities are not expected to interact with shellfish aquaculture in the proposed project area. Further analysis and modeling described the possible interaction between shellfish aquaculture and the halibut trawl fishery was used to develop the final proposal for siting of the twenty 100-acre production sites within federal waters.

The suitability of potential growing areas will be further validated through the deployment of a set of four sentinel research buoys. These sentinels consist of a single strand of mussel grow-out line suspended from a buoy, anchored to the bottom at six locations. Periodic sampling of mussels stocked to these sentinel lines will produce an early data set relative to site suitability with respect to site-specific animal growth and health, and for shellfish sanitation plan development and certification, among other data that can inform site conditions.

Ocean bottom in the proposed project area is owned by the U.S. Federal Government with permitting authority vested in the Corps. Studies of individual growing areas will provide information that characterizes the general hydrographic and benthic characteristics of the area and identifies any sensitive or important habitats that are present locally within the likely impact zone of the mussel farm.

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1.5 Project Approach

The Project will focus on cultivation of Mediterranean mussels.¹ The Mediterranean mussel is established and naturalized within the Santa Barbara Channel. It is currently approved for cultivation in Southern California, and there is an established market for its distribution and sale. Mussel species, and specifically Mediterranean mussels, have been successfully cultivated worldwide for centuries. Forty percent of modern world mussel production occurs in China. Other significant producers include Canada, Chile, New Zealand, and European countries.

1.5.1 Cultivation Methods

The Project proposes to use established protocols and gear for offshore cultivation referred to as the submerged long line method. A general depiction of the submerged long line deployment is shown on Figures 2 - 5. This consists of a horizontal structural header line, or “backbone,” that is attached to the seafloor by sand screw anchors at each end, and is marked and supported by a series of buoys along the central horizontal section. Buoys marking the location of the sand screw anchors describe the total cultivation area for navigational safety and will comply with all regulations for height, illumination, and visibility, including radar reflection. Buoys attached to the central horizontal portion of the backbone line support the line, provide means via lifting of the backbone line to access the cultivation ropes, and determine the depth of the submerged backbone. The depth of the backbone will vary seasonally from 15 to 45 feet below the surface. All surface buoys will be uniquely colored for each operator and marked with the grower/producer name and phone number.

The long line configuration produces a fairly rigid tensioned structure from which the cultivation ropes, or “fuzzy ropes” are attached. Fuzzy ropes are characterized by extra filaments, which provide settlement substrate for mussels to attach. Fuzzy ropes may be attached to and suspended from the backbone rope either as individual lengths or as a continuous looping single length that drapes up and down over the backbone. The length of each section or loop of fuzzy cultivation loop will be approximately 20 feet but will depend on the lifting capacity of the servicing vessel. The length of the central horizontal section of backbone line will be approximately 600 feet, which will support approximately 8,000 to 10,000 feet of fuzzy cultivation line.

The shape of each of the 100-acre cultivation parcels will be a function of the geometry of the submerged backbone line and anchoring. 100-acre parcels maintain rectangular dimensions of 2200 feet by 1980 feet. The 2200' dimension is determined by the length of two longlines placed end-to

¹ VPD may seek approval to cultivate other species in addition to Mediterranean mussels, which may include marine algae. Any such additional species and their proposed cultivation methods will be included in the project applications submitted to regulatory agencies.

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end. Each horizontal section of the longline will be approximately 600 feet long and will require an anchor scope of approximately 2.5 times depth at each end. Therefore, in 100 feet of water depth, scope from the 600' horizontal section of backbone to the sand screw anchor will require 250 feet on each end of the line, making a total length of 1,100 feet from sand screw to sand screw. Horizontal sections will be submerged approximately 20 feet below the surface. To optimize space, two lines will be deployed end-to-end sharing a helical sand anchor in the middle. The 1980' dimension is determined by spacing 14 end-to-end longline pairs with 150' of spacing between each pair per 100-acre parcel. Additionally, each 100-acre parcel will be buffered by 300' of open water on each side. Buffers outside the parcel are not included in the 100 acres.

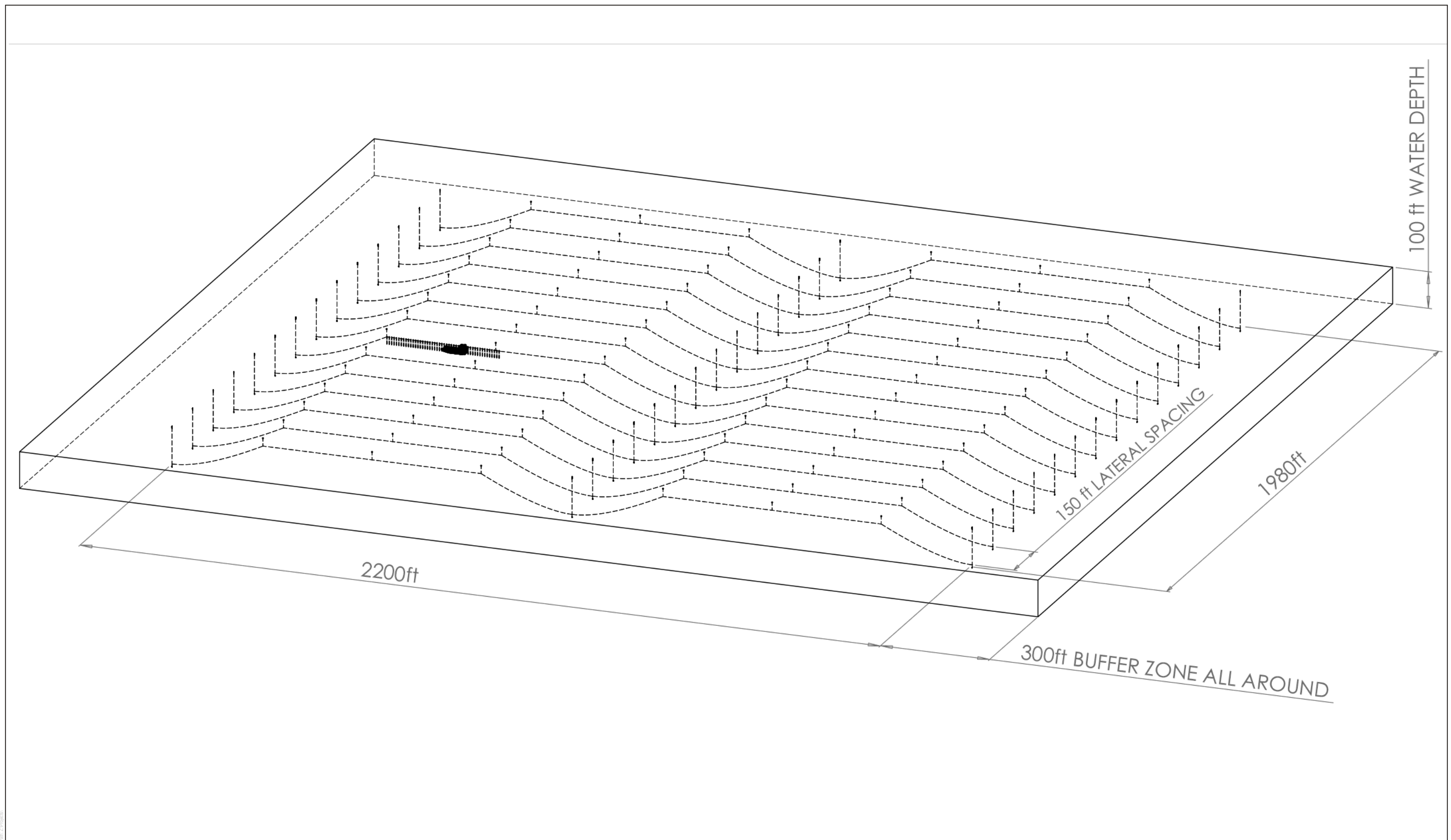
The submerged longline growing gear configuration will be specifically engineered for open ocean conditions with respect to size and strength of all line, anchoring, hardware, and buoyancy.

Juvenile mussels, also known as “seed” or “spat,” will initially be provided by certified hatchery production. Competent spat are settled to the fuzzy cultivation ropes in the hatcheries. When the seed are firmly settled to ropes, the ropes are covered with cotton socking material to protect them from shaking off the ropes during transport to the offshore growing site and deployment. The socks hold the spat next to the rope until the mussels naturally attach with their byssal threads, after which the cotton material naturally degrades. If approved by the appropriate regulatory agencies, subsequent plantings may include wild spat recruited on existing longlines. Juvenile mussels will grow on lines until an intermediate size where the density of mussels on the fuzzy rope becomes limiting. At this point, a servicing vessel will lift the backbone line in order to access the fuzzy rope stocked with juvenile mussels and pulls the fuzzy rope through vessel based equipment designed to strip the mussels from the fuzzy rope and then clean, separate, and grade the juvenile mussels by size. Juvenile mussels are then restocked to clean fuzzy rope at a reduced density for their second stage of grow out to market size. At market size, which is expected to occur in about one year of total production time, the submerged backbone lines are again lifted in order to access the fuzzy cultivation ropes, and mussels are again stripped from the line, cleaned, and separated, and this time size-graded and bagged for landing at the Ventura Harbor as market-ready product. All husbandry activities related to harvesting, grading, and restocking of mussels to cultivation lines occur onboard the servicing vessel using specialized equipment for that purpose.

Purchased spat will be from CDFW-approved hatcheries. The hatcheries are not part of this Project.

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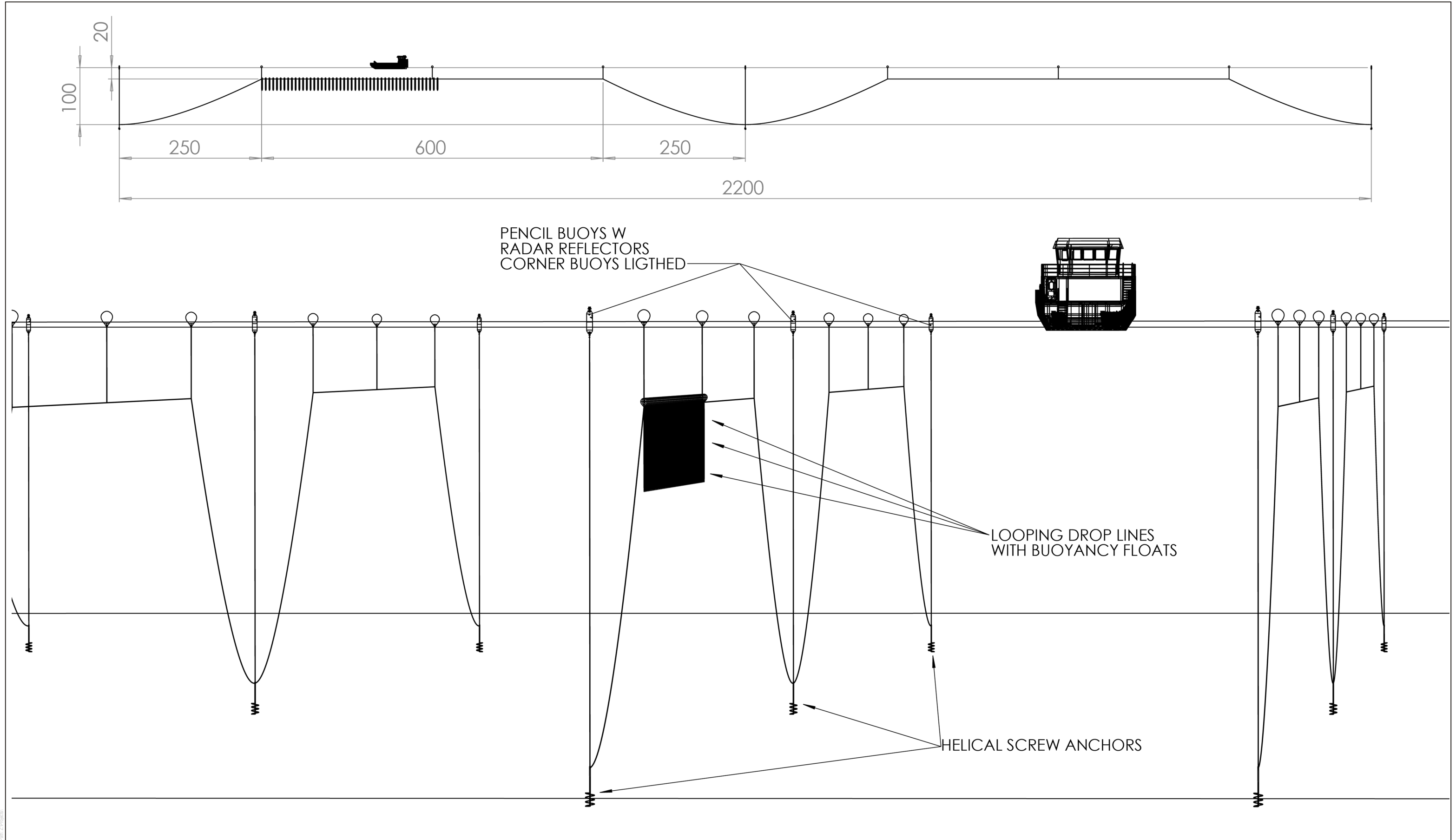
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SOURCE: Argonauta Design & Engineering LLC

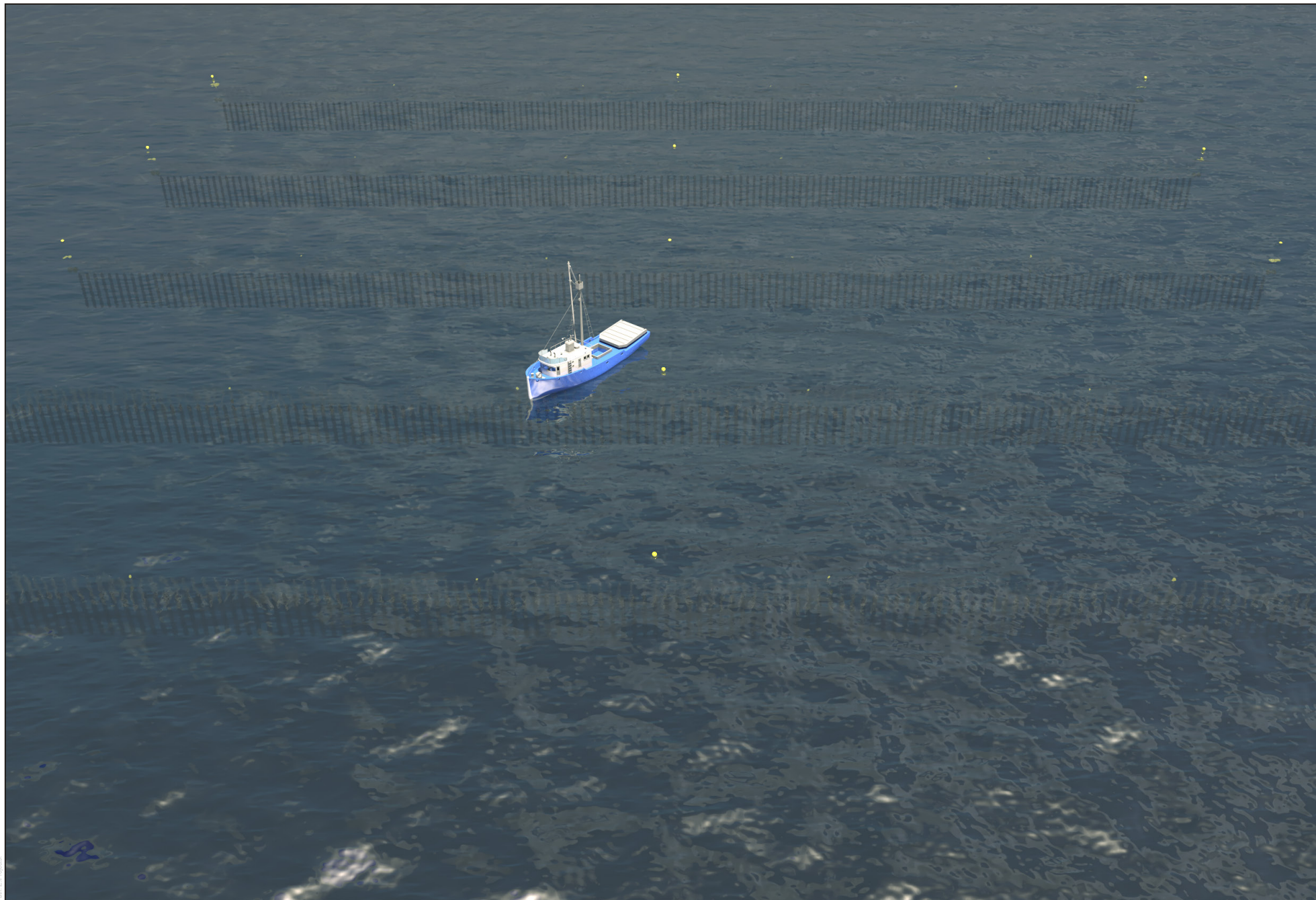
FIGURE 2

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SOURCE: Argonauta Design & Engineering LLC

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SOURCE: Dudek

DUDEK

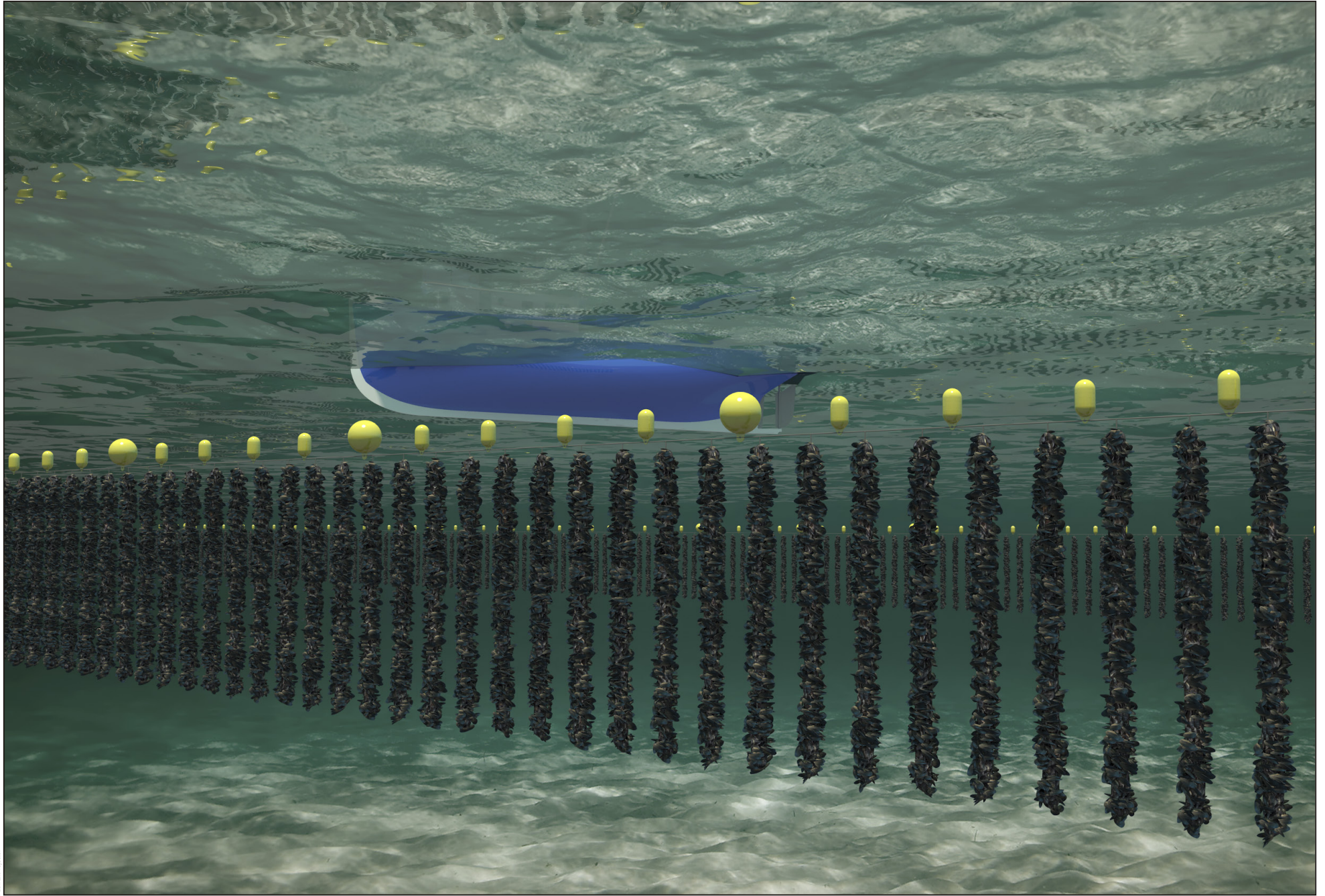
FIGURE 4

View Above the Water

Ventura Shellfish Enterprise

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SOURCE: Dudek

DUDEK

FIGURE 5
Mussel Farm Underwater
Ventura Shellfish Enterprise

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Gear and planted ropes will be inspected regularly as part of a comprehensive monitoring plan, but generally the planted ropes will only be manipulated during initial stocking, intermediate harvest and restocking, and final harvest. Inspection will involve monitoring the all hardware and rigging and surface buoys and their tension, and checking for escaped gear and potential entanglements. Examples of possible observations that would trigger concern and further investigation are (1) gaps or tangling of dropper ropes detected on depth finder or other structural anomalies, (2) fouling by objects or other marine debris detected in support buoys or buoy deployment lines, and (3) loss of function or damage to devices related to navigational safety.

Watercraft used for planting, inspections, and harvesting will be home ported at Ventura Harbor. On average, between 20 and 40 boats will be traveling to the specific lease sites to conduct these activities on a three-times-per-week to daily basis. The maximum distance traveled will be between Ventura Harbor and the farthest potential permit area, which could be up to 9 miles.

All mussel product from the Project will be landed at Ventura Harbor. Ventura Harbor is one of the primary offloading sites in California for commercial squid. As a consequence, Ventura Harbor has significant commercial fishing infrastructure. However, there may be a need to make some modifications or improvements to these existing harbor landing facilities to accommodate mussel offloading.

Landed product will comply with all testing and labeling regulations required under the NSSP and/or required by NOAA-SIP or CDPH.

1.5.2 Project Construction

Submerged backbone lines will be attached to the seafloor using sand screw anchors. Sand screw anchors have been shown to exhibit superior holding power and are removable. The deployment of sand screw anchors will require specialized workboat equipment. This requirement will necessitate staged deployment of long lines in order to accommodate the installation process across all sites.

The Project will include a decommissioning plan, which will provide for the removal of all equipment and structures in each permit area associated with project activities when activities in that area are terminated. The Project will provide financial assurance for decommissioning.

1.5.3 Protected Species Conservation Measures

Project design specifications are intended to minimize protected marine mammal and sea turtle entanglement. Additional design features may be incorporated as identified through the environmental review process.

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The architecture of the longline is a thick (1-inch-diameter) tensioned (to approximately 800 pounds) rope that is not conducive to wrapping around or entangling protected species. The mussel grow-out ropes themselves are typically planted with seed 3 inches thick and may grow to be stiff with byssus at diameters of 10 inches or more at harvest, thus making them very unlikely sources of entanglement. As an additional precaution, grow-ropes will be attached to the headrope with a low-breaking-strength twine (4-millimeter (0.16-inch) diameter; <1,000 pounds), which will facilitate rapid detachment in the unlikely event of any interaction with the longline.

Potential entanglement points include (1) two vertical lines to the surface buoys marking each end of the headrope, (2) one pull-up buoy line for servicing at the midpoint, and (3) a variable number of submerged buoys, dependent on line loading, to provide buoyancy along the horizontal backbone line. To minimize the entanglement hazard, a 1,100-pound breakaway link will be installed between the buoys and the vertical lines, similar to strategies used to mitigate potential entanglement in trap fisheries in the northeastern United States (NOAA 2008). Buoy lines between the surface and headrope are generally under tension partially equivalent (0 to 10 kilograms (0 to 22 pounds)) to their full buoyancy (42 kilograms (93 pounds)).

As noted in the Nationwide Permit (NWP) 48 Decision Document recently approved by the Corps, which considered shellfish aquaculture uses nationwide, “Compared to the disturbances and degradation caused by coastal development, pollution, and other human activities in coastal areas, commercial shellfish aquaculture activities present relatively mild disturbances to estuarine and marine ecosystems.” The Decision Document concludes that impacts from most aquaculture projects would be *de minimis* on the surrounding environment. This determination is generally reaffirmed in the Corps’s 2015 Programmatic Biological Assessment (BA) that considered new and existing shellfish aquaculture in Washington State, as well as the 2016 Programmatic Biological Opinions from NOAA’s National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) evaluating the same, which concluded that impacts would be minor upon imposition of identified conservation measures. Notably, the above analyses evaluated shellfish aquaculture at a larger scale than that proposed by the Project. NWP 48 covers most shellfish aquaculture projects nationwide and the Programmatic BA evaluated environmental impacts associated with a total of 38,400 commercial aquaculture acres in Washington.

1.5.4 Best Management Practices

In addition to the design features associated with minimizing impacts on marine mammals and sea turtles, the Project will incorporate a number of other resource protection measures that avoid and minimize impacts on the aquatic environment. These resource protection measures will

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include BMPs related to carrying capacity, seed supply, sediment quality, predator and wildlife interactions, and storage and disposal of aquaculture gear. The BMPs will be incorporated in Project permit conditions and/or mitigation measures and implemented by individual growers/producers. The aquatic environment will benefit from a cumulative beneficial effect of these BMPs resulting from the programmatic nature of the Project. For example, there will be unique opportunities for a programmatic monitoring plan among the 20 cultivation areas that will provide a more comprehensive data set compared to project-by-project permitting and will also reduce individual efforts. Proposed BMPs are described in Table 2.

Table 2
Ventura Shellfish Enterprise BMPs

Measure	Description of Measure
Carrying capacity – 1	Make use of best available data to define the location of a farm and its maximum stocking density.
Carrying capacity – 2	Include in overall management plan a component that describes the corrective or collaborative actions to be taken when production carrying capacity at the farm or ecosystem level is exceeded.
Seed supply – 1	Initial plantings will only use hatchery-reared mussel spat certified by CDFW. Wild spat will only be used for subsequent plantings upon approval from the relevant agencies.
Sediment quality – 1	Monitor sediment conditions according to the requirements of all permits.
Sediment quality – 2	Adopt corrective actions in cases where significant adverse impacts are identified by the sediment monitoring program.
Wildlife – 1	Produce a written Marine Wildlife Entanglement Plan that identifies policies and procedures that will be followed to monitor for marine wildlife entanglements and report and remedy any such entanglements if they occur.
Wildlife – 2	Use humane methods of predator deterrence and actively favor non-lethal methods.
Wildlife – 3	No controls, other than non-lethal exclusion, shall be applied to species that are listed as threatened or endangered.
Storage and disposal of supplies – 1	Fuel, lubricants, and chemicals shall be labeled, stored and disposed of in a safe and responsible manner, and marked with warning signs.
Storage and disposal of supplies – 2	Precautions shall be taken to prevent spills, fires and explosions, and procedures and supplies shall be readily available to manage chemical and fuel spills or leaks.
Storage and disposal of supplies – 3	Include in overall management plan an aquaculture gear monitoring and escapement plan. Any farm gear that has broken loose from the farm location shall be retrieved.

Source: Adapted from Global Aquaculture Alliance 2013.

Notes: BMP = best management practice;

Organization and Governance

Mussel farming opportunities will be available to Project growers/producers, anticipated to include existing commercial fishermen based in Ventura Harbor, existing commercial shellfish businesses, and startups that otherwise would be disinclined to embark on the lengthy and

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expensive mandatory regulatory pathway. As a requirement of their participation, growers/producers will be obligated to operate under robust environmental monitoring guidelines and BMPs incorporated into Project entitlements and adopted from third-party certification agencies. Identifying the agency personnel who will be responsible for growing area patrol and enforcement will require further refinement as the process develops.

1.5.5 Monitoring Program

Conditions within the Project area will be monitored throughout Project implementation to ensure compliance with all permit requirements and to evaluate all effects, including beneficial effects, of the growing areas. Monitoring will be conducted according to a robust monitoring program designed to evaluate the Project's potential effects on the following factors:

- The seafloor and benthic environment beneath and in the vicinity of the facilities, including biological, physical, and chemical conditions
- Wildlife interactions including marine mammals, sea turtles, fish, and seabirds
- Marine debris, including lost and broken gear

The monitoring program and protocols will be vetted with input and coordination among the regulatory agencies and will include annual reports summarizing the previous year's implemented Project activities, all activities that have been implemented since the start of the Project, all activities that have been implemented within the designated monitoring period, and all monitoring results.

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2 REQUIRED PERMITS AND ENTITLEMENTS

Based on current understanding of the Project, including its offshore location, the following list of federal and state permits and approvals has been developed.

2.1 Federal Requirements and Associated Agencies

2.1.1 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Corps) exercises regulatory jurisdiction over certain activities within waters of the United States. The Corps receives its statutory authority from Section 404 of the Clean Water Act, which regulates placement of dredged or fill material in jurisdictional waters of the United States, and Section 10 of the Rivers and Harbors Act of 1899, which regulates the construction of any structure in or over any navigable water of the United States or any work affecting the course, location, condition, or capacity of such waters.

The Project would involve the placement of structures located in offshore waters, and would not be subject to Corps regulatory authority under Section 404 of the Clean Water Act, because there will not be a discharge of dredged and/or fill material into waters of the United States. The proposed project would be required to obtain authorization under Section 10 of the Rivers and Harbors Act for structures and work in navigable waters.

General permits are authorizations that are issued for a category or categories of activities that are similar in nature and do not cause more than minimal individual and cumulative adverse environmental effects. Nationwide permits (NWP) are a type of general permit designed to regulate certain activities having minimal impacts. The NWPs are proposed, issued, modified, reissued (extended), and revoked from time to time after an opportunity for public notice and comment. An activity is authorized under an NWP if that activity and the permittee satisfy all of the NWP's terms and conditions.

NWP 48, Commercial Shellfish Aquaculture Activities, authorizes discharges of dredged or fill material into waters of the United States or structures or work in navigable waters of the United States necessary for new and continuing commercial shellfish aquaculture operations in authorized project areas. The project area is the area in which the operator is authorized to conduct commercial shellfish aquaculture activities, as identified through a lease or permit issued by an appropriate government agency, a treaty, or any easement, lease, deed, contract, or other legally binding agreement that establishes an enforceable property interest for the operator. A "new commercial shellfish aquaculture operation" is an operation in a project area where commercial shellfish aquaculture activities have not been conducted during the past 100 years. This NWP authorizes the installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other

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structures in navigable waters of the United States. This NWP also authorizes discharges of dredged or fill material into waters of the United States necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities. Rafts and other floating structures must be securely anchored and clearly marked.

Regional general permits are a type of general permit issued by a division or district engineer and can improve regulatory consistency and enhance program efficiency.

Letters of Permission are another type of Corps permit issued through an abbreviated processing procedure which includes coordination with federal and state fish and wildlife agencies and a public interest evaluation, but without the publishing of an individual public notice. A Letter of Permission can be used when the proposed work would be minor, would not have significant individual or cumulative impacts on environmental values, and should encounter no appreciable opposition.

Standard individual permits are evaluated on a case-by-case basis for activities that do not qualify for a general permit or a Letter of Permission. Individual permits are processed through the Corps's public interest review procedures, including public notice and receipt of comments. The approach for the Project would be to obtain an NWP 48 or an individual permit for the entire Project.

Permitting Process

- **Data Required:** For all activities requiring permits and associated notification to the Corps, an application must be submitted, using standard ENG Form 4345. The application must include a complete description of the proposed activity including necessary drawings or plans; the location, purpose and need for the proposed activity; scheduling; the names and addresses of adjoining property owners; the location and dimensions of adjacent structures; and a list of authorizations required by other federal, state, or local agencies.
- **Analysis Required:** In order to write up the necessary decision document (Environmental Assessment including Public Interest Determination) and make a permit decision, the Corps may require additional information be provided by the applicant for the Corps's analysis. This information could include an alternatives analysis of alternate sites, methods, and project scales; information necessary to complete the required public interest review evaluating such factors as potential impacts to navigation, economics (impacts to fisheries), fish and wildlife values, and general environmental concerns; and a compensatory mitigation plan in cases where the Corps determines mitigation is required to offset unavoidable impacts to aquatic resources. The Corps will need to determine that the project is not contrary to the public interest in order to issue a permit.

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- **Related Laws**

- **Endangered Species Act:** If the project may affect federally listed species or their critical habitat, a consultation with U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) will be required. The applicant would need to provide the Corps with a Biological Assessment (BA) or Biological Evaluation (BE) identifying and analyzing the potential impacts to these listed species.
- **Coastal Zone Management Act:** Activities affecting the coastal zone require approval of a certification from the California Coastal Commission (Coastal Commission) that the proposed activity complies with and will be conducted in a manner consistent with the California Coastal Act (Coastal Act).
- **Section 401 Water Quality Certification:** If water quality certification is necessary for the proposed project, the Corps permit cannot be issued until the required certification has been obtained.
- **Historic Properties:** If the proposed activity would involve any property listed or eligible for listing in the National Register of Historic Places, a consultation will be required with the State Historic Preservation Officer. The applicant would need to provide the Corps with a cultural resources report identifying and analyzing the potential effects to historic properties.
- **Timing:** The Corps's goal is to complete Individual Permits in less than 120 days. The actual time between application submittal and permit issuance is often much longer, often between 1 and 2 years, but this length of time can be reduced substantially with effective pre-application coordination and project planning.
- **Fees:** A fee of \$100.00 will be charged with the purpose of the project is commercial or industrial in nature and is in support of operations that charge for the production, distribution, or sale of goods or services.

2.1.2 U.S. Fish and Wildlife Service

USFWS has jurisdiction over federally listed wildlife and plant species under the federal Endangered Species Act (ESA). Section 7(a)(2) of the ESA requires federal agencies to consult with USFWS to ensure that actions authorized, funded, or undertaken by the agency are not likely to jeopardize the continued existence of any federally listed species or result in the adverse modification of designated critical habitat.

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The Corps, as the lead federal agency, would be required to consult with the USFWS Region 8 to ensure that the issuance of the Corps permit would not jeopardize any federally listed species or adversely modify critical habitat. It is anticipated that the Project will have no effect on USFWS-regulated federally listed species or adversely modify designated critical habitat, because none are expected to occur in the Project lease area, which is located within the open-ocean environment. For a project that may affect but is not likely to adversely affect any USFWS-regulated federally listed species or adversely modify designated critical habitat, the Corps may request an informal consultation with USFWS to receive a Not Likely to Adversely Affect concurrence letter.

It is not anticipated that any federally listed species under the jurisdiction of the USFWS would be affected by the proposed project. In the event a determination is made that the project might affect federally listed species, the consultation process would occur as follows:

Consultation Process

- **Data Required:** The applicant typically prepares and submits a BA or BE to the Corps for the Section 7 consultation. The BA/BE should contain the following elements:
 1. Cover Letter
 - a. Briefly specify the proposed action. Include a description of both the federal action (e.g., issue Section 10 Rivers and Harbors Act permit) and the applicant's action (e.g., establish and operate shellfish aquaculture).
 - b. Make a determination for each listed species and designated critical habitat (i.e., no effect; may affect, not likely to adversely affect; or may affect, likely to adversely affect).
 2. Project Description
 - a. Provide a detailed description of the proposed action, including secondary project features such as staging areas. Subdivide proposed action into project elements (e.g., construction, operation, and maintenance).
 - b. Describe the where, when, and how for each project element.
 - c. Include a map delineating the location of each project element.
 - d. Delineate the geographic area that will be affected; i.e., the area where the physical, chemical, and biotic effects will occur.
 - e. Delineate the specific areas that will be affected by each of the project elements.
 3. Species, Suitable Habitat, and Critical Habitat Description(s)

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- a. Identify the species or critical habitat that may be present.
 - b. Provide a description of the habitat and/or plant communities on site and within the project vicinity.
 - c. Document how you identified these habitats and species occurrences.
 - d. Describe the current population and habitat conditions (status and trend, if known) in the action area for each protected resource that may be present.
4. Effects Analysis
- a. For each species or critical habitat parcel, explain how it will or will not be exposed to the project elements; be sure to consider effects to all life stages.
 - b. Describe the anticipated response (e.g., none, abandoned the area, decreased foraging success, reduced fecundity, injury, death) from any likely exposure.
 - c. Describe and analyze all direct and indirect effects of the action.
 - d. Describe and analyze all effects of interdependent and interrelated actions.
 - e. *Cumulative Effects Analysis:* Identify any future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area. Describe how such activities will affect listed resources within the action area.
5. Conservation Measures
- a. Describe actions incorporated into the design of the proposed action to avoid or reduce adverse effects to and incidental take of listed species.
 - b. Conservation measures may be alterations in the proposed activity such as timing restrictions, access closures, or changes in project features or location.
6. Conclusion and Determination of Effects
- a. For each protected resource, make a Section 7 determination and include rationale.
 - b. For a “may affect, but not likely to adversely affect” finding, request USFWS concurrence. For a “may affect, likely to adversely affect” finding, request initiation of formal consultation.
7. Literature Cited
8. List of Preparers
- **Analysis Required:** The USFWS will review the BA/BE and determine whether or not it concurs with the effects conclusions presented. For a “not likely to adversely affect” finding, the USFWS will write a concurrence letter and complete the informal

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consultation. For a “may affect, likely to adversely affect” finding, the USFWS will need to determine whether an action will result in jeopardy. The USFWS will begin by looking at the current status of the species, or baseline. Added to the baseline are the various effects—direct, indirect, interrelated, and interdependent—of the proposed action. USFWS also examines the cumulative effects of other non-federal actions that may occur in the action area. USFWS’s analysis is then measured against the definition of jeopardy, which occurs when an action is reasonably expected, directly or indirectly, to diminish a species’ numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

- **Timing:** Formal consultations are expected to take 90 days, after which USFWS will prepare a biological opinion within 45 days after completion of formal consultation. Informal consultations are expected to take approximately 1 month.
- **Fees:** None.

2.1.3 NOAA National Marine Fisheries Service

NMFS is an organization within NOAA with jurisdiction over federally listed marine and anadromous fish, sea turtles, and marine mammals, as well as economically important fisheries and fish habitat. Section 7(a)(2) of the ESA requires federal agencies to consult with NMFS to ensure actions authorized, funded, or undertaken by the agency are not likely to jeopardize the continued existence of any federally-listed species or result in the adverse modification of designated critical habitat. Listed species that could potentially occur within the VSE Project lease areas include green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), and fin whale (*Balaenoptera physalus*).

Additionally, NMFS has authority under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which is the primary law governing marine fisheries management in U.S. federal waters. Under the Magnuson-Stevens Act, federal agencies must consult with NMFS on all actions that may adversely affect essential fish habitat (EFH). The Project occurs within EFH for various federally managed fish species within, potentially, Coastal Pelagic Species, Highly Migratory Species, and Pacific Coast Groundfish Fisheries Management Plans.

The Corps as the federal lead agency would be required to consult with NMFS under Section 7 of the ESA and under the Magnuson-Stevens Act for EFH. It is anticipated that the Project may affect but is not likely to adversely affect any NMFS-regulated federally listed species or adversely modify designated critical habitat and that the Corps may therefore request an informal consultation with NMFS to receive a Not Likely to Adversely Affect concurrence letter.

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Consultation Process

- **Data Required:** The applicant will prepare a BA or BE, similar to that written for USFWS species, for consultation under Section 7 of the ESA. For NMFS, the BA/BE will include additional information in the form of an EFH Assessment regarding potential adverse effects to EFH, for consultation pursuant to the Magnuson-Stevens Act. The level of detail in an EFH Assessment should be commensurate with the complexity and magnitude of the potential adverse effects of the action. At a minimum, an EFH assessment must contain a description of the proposed action; an analysis of the potential adverse effects of that action on EFH and the managed species; the federal action agency's conclusions regarding the effects of the action on EFH; and proposed mitigation, if applicable. If appropriate, the assessment should also include the results of on-site inspections, the views of recognized experts on affected habitat or fish species, a review of pertinent literature, an alternatives analysis, and any other relevant information.
- **Analysis Required:** In addition to making an ESA determination under a similar process as the USFWS's determination process, NMFS will assess the potential adverse effects to EFH. NMFS will provide EFH Conservation Recommendations to the lead federal agency (the Corps), and the Corps will make a determination as to whether those Conservation Recommendations will be incorporated into the Corps's permit conditions.
- **Timing:** Formal consultations are expected to take 90 days, after which NMFS will prepare a biological opinion within 45 days after completion of formal consultation. Informal consultations are expected to take approximately 1 month.
- **Fees:** None.

NOAA also regulates the Marine Mammal Protection Act of 1972, and is charged with protecting whales, dolphins, porpoises, seals, and sea lions by prohibiting, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. NMFS authorizes incidental take under the Marine Mammal Protection Act to U.S. citizens and U.S. based companies, if there is a finding that the taking would be of small numbers, would have no more than a negligible impact on those marine mammal species or stocks, and would not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses.

It is anticipated that the VSE Project would not result in the take of any marine mammals. Should NMFS determine there might be a potential for take, the Project could apply for a Letter of Authorization. NMFS issues Letters of Authorization for actions that have the potential to result in harassment (i.e., injury or disturbance) and that are planned for multiple years.

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Letter of Authorization Process

- **Data Required:** The Project would apply for an Incidental Take Authorization, and the application would need to include the following elements:
 1. Description of specified activity
 2. Dates and duration, specified geographic region
 3. Species and numbers of marine mammals
 4. Affected species status and distribution
 5. Type of incidental taking authorization requested
 6. Take estimates for marine mammals
 7. Anticipated impact of the activity
 8. Anticipated impacts on subsistence uses
 9. Anticipated impacts on habitat
 10. Anticipated effects of habitat impacts on marine mammals
 11. Mitigation measures
 12. Arctic Subsistence Plan of Cooperation
 13. Monitoring and reporting
 14. Suggested means of coordination
- **Analysis Required:** In looking at the effects of activities, NMFS will use information from the application, monitoring reports for previous similar activities, National Environmental Policy Act (NEPA) documents, the ESA consultation (when required), and additional scientific literature. NMFS will then analyze how the proposed project may impact marine mammals in the area, their habitats, and the availability of marine mammals for subsistence uses.
- **Timing:** Applications should be submitted 18 months in advance of the intended project start date.
- **Fees:** None.

NOAA Office of National Marine Sanctuaries

The National Marine Sanctuaries Act designates and protects areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical,

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scientific, cultural, archaeological, educational, or aesthetic qualities as national marine sanctuaries. The branch of NOAA responsible for management of national marine sanctuaries is the Office of National Marine Sanctuaries.

The National Marine Sanctuaries Act requires federal agencies whose actions are likely to destroy, cause the loss of, or injure a sanctuary resource to consult with the program before taking the action. NOAA will then recommend reasonable and prudent alternatives to protect sanctuary resources.

The nearest national marine sanctuary to the proposed project is the Channel Islands National Marine Sanctuary. The sanctuary encompasses 1,110 square nautical miles (1,470 square miles) of water from mean high tide to 6 nautical miles offshore of Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, and San Miguel Islands. The proposed VSE Project location is at least 12 nautical miles from the nearest border of the sanctuary. There is a network of Marine Protected Areas within the nearshore waters of the Channel Islands National Marine Sanctuary. Within this Marine Protected Area network are 11 marine reserves, within which all take and harvest is prohibited, and 2 marine conservation areas, which allow limited take of lobster and pelagic fish. The proposed location of the Project lease areas would not fall within the Channel Islands National Marine Sanctuary boundaries and as a result, the Project would not be required to consult with the Office of National Marine Sanctuaries.

2.1.4 U.S. Coast Guard

The U.S. Coast Guard (Coast Guard) has regulatory authority over Private Aids to Navigation (PATON) under Title 33 of the Code of Federal Regulations, Part 66. PATONs include buoys, lights, or day beacons owned and maintained by any individual or organization other than the Coast Guard and require a Coast Guard permit. PATONs are designed to allow individuals or organizations to mark privately owned marine obstructions or other similar hazards to navigation and must be maintained by the owner as stated on the Coast Guard permit. All aquaculture leases must be clearly marked with a minimum of one buoy anchored on each of the four corners and one buoy, possessing radar-reflecting capabilities, anchored in the center of each aquaculture lease. All buoys used to define the boundaries of an aquaculture lease must be marked in conformance with the International Association of Lighthouse Authorities Maritime Buoyage system regulations (33 CFR Sections 62.33 and 66.01-10). The proposed Project would be required to obtain a PATON Permit from the Coast Guard.

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PATON Application

- **Data Required:** Submit an application (Form CG-2554) that specifies information about the buoys, including light flash period, light flash length, and light color; position, depth of water, candela, and focal plane height; and structure type, color, and height above ground.
- **Analysis Required:** The Coast Guard will evaluate the navigational safety of the object placed in the water, and will determine if it should be lighted and/or placed on the chart. PATONs are required to be maintained by the owner as stated on the Coast Guard permit.
- **Timeline:** Applications should take 60 to 90 days or less to process.
- **Fees:** None.

2.1.5 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) exercises regulatory jurisdiction over water quality in federal waters of the United States and administers Section 401 Water Quality Certifications pursuant to the Clean Water Act. Section 401 of the Clean Water Act requires applicants for federal permits to conduct activities which may result in any discharge into navigable waters that the discharge will comply with applicable quality standards. In the federal waters of the United States outside of California state waters, the EPA is the agency with the authority to issue 401 Water Quality Certifications.

- **Data Required:** Issuance of a Section 401 Certification requires information demonstrating the project will comply with federal water quality standards and aquatic resources protection requirements. A Section 401 permit application should include information including a detailed project description, discussion of avoidance and minimization of impacts to federal waters, impacts analysis, discussion of beneficial uses, identification of pollutants of concern and short- and long-term best management practices (BMPs) to minimize discharge of pollutants, and all associated figures (vicinity maps, project site maps, construction cross-sections, and others). Additionally, the EPA may require information pertaining to baseline benthic habitat and community assessments within the Project area and a monitoring plan for the operation of the aquaculture facility.
- **Analysis Required:** Analysis by the EPA is intended to authorize and regulate discharges from aquaculture facilities. Analysis would consider impacts to the following beneficial uses: industrial processes and industrial service supply; wildlife habitat; migration of aquatic organisms; preservation of biological habitats of special significance; rare, threatened, or endangered species; water contact and non-contact

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recreation, including aesthetic enjoyment; navigation; commercial and sportfishing; mariculture; marine habitat; and fish spawning and shellfish harvesting.

- **Timing:** The EPA has 30 days to deem the application complete. The EPA has 180 days to act on a complete permit submittal. There is a public notice period that commences once the application is deemed complete.
- **Fees:** None.

2.2 State Agencies

2.2.1 California Coastal Commission

The California Coastal Commission (CCC) has planning, regulatory, and permitting responsibilities, in partnership with local governments, over all “development” taking place within the coastal zone, which extends seaward 3 miles and landward from several miles inland to as close as a few hundred feet from the shore in other areas, under the Coastal Act and the federal Coastal Zone Management Act (CZMA). The Coastal Commission plans and regulates activities on land and water within the coastal zone or permits local agencies to make decisions under the guidance of an approved Local Coastal Program. Among the coastal resources specifically protected within the Coastal Act are public access to the coastline, wetlands and other environmentally sensitive habitat areas, marine biological resources, agriculture, low-cost visitor-serving recreational uses, visual resources, commercial and recreational fishing, and community character.

The CCC retains original coastal permit jurisdiction over development proposed on tidelands, submerged lands, and public trust lands in California state waters; however, the CCC’s original jurisdiction does not extend to federal waters. For projects in federal waters that may have an impact on California coastal uses or resources, an applicant is required under the CZMA to obtain a consistency determination from the CCC.

- **Data Required**
 - Copies of the federal permit applications,
 - Detailed description of the proposal,
 - Description of associated facilities,
 - Description of coastal effects,
 - Comprehensive data and information sufficient to support the applicant’s consistency certification, and

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- Consistency analysis of the project and its associated facilities with enforceable policies of the CCMP, Chapter 3 of the California Coastal Act
- **Analysis Required:** The Coastal Commission staff completes an analysis of the application for consistency with the Coastal Act. The results of this analysis are described in the form of a staff report to the Commissioners, which includes suggested findings, recommendations, and any special conditions.
- **Timing:** Under normal circumstances, the Coastal Commission must act on a filed application within a “limited time frame.” The Consistency Certification review period is up to 6 months. Applicants may extend either of these time frames. Pursuant to the Code of Federal Regulations, Title 15, Section 930.62(b), if the Commission has not issued a decision within three months, it must notify the applicant and federal agency of the status of the matter and the basis for further delay.
- **Fees:** Fees will be determined individually and are generally based on the cost of development. Public entities are not required to submit a filing fee under CA Government Code Section 6103.

2.2.2 California Department of Public Health

The California Department of Public Health (CDPH) is the state department under the State of California Health and Human Services Agency that is responsible for public health in California. At the state level, the California Department of Food and Agriculture has primary responsibility for food safety, but CDPH operates a parallel food safety program called the California Shellfish Sanitation Program.

The California Shellfish Sanitation Program regulates the growing, harvesting, processing, and marketing of shellfish intended for sale for human consumption. The CDPH defines “shellfish” as “edible bivalve molluscan shellfish, including oysters, mussels, clams, and scallops.”

The California shellfish sanitation program follows the standards and guidelines of the National Shellfish Sanitation Program (NSSP) Model Ordinance, and various other guidelines of the U.S. Food and Drug Administration. For information on the NSSP, contact the U.S. Food and Drug Administration:

U.S. Food and Drug Administration
Program and Enforcement Branch
5100 Paint Branch Parkway
College Park, Maryland 20740-3835
301.436.1410

<http://www.fda.gov/Food/GuidanceRegulation/FederalStateFoodPrograms/ucm2006754.htm>

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The CDPH Shellfish Sanitation Program's post-harvest process is applicable to product landed in California:

- **Post-harvest** regulates the handling, processing, and distribution of shellfish after they are harvested, including inspection of shellfish plants and issuance of the Shellfish Handling and Marketing Certificate. This program segment is conducted by staff of the Food and Drug Branch (FDB). For questions or assistance, contact FDB:

Nicole Givens
Food and Drug Branch – MS 7602
1500 Capitol Avenue
PO Box 997413
Sacramento, California 95899-7413
Phone: 916.319.9661
Fax: 916.440.5138
Nicole.Givens@cdph.ca.gov

This post-harvest process requires a Handling and Marketing Certificate from the FDB of CDPH, which cannot be issued before a Growing Area Certificate has been issued. Firms that process, handle, and distribute shellfish must obtain a Shellfish Handling and Marketing Certificate from FDB. This includes businesses involved in the distribution of shellfish that do not take physical possession of the shellfish. The Shellfish Handling and Marketing Certificate is required even if the facility has a Processed Food Registration. The Shellfish Handling and Marketing Certificate is free.

A Processed Food Registration is not required if firms exclusively manufacture, handle, and distribute raw, fresh, or frozen (shucked or in-the-shell) shellfish.

The Shellfish Handling and Marketing Certificate assigns a dealer's number for each certified facility and authorizes a dealer to engage in specific activities such as repacking, reshipping, and shucking shellfish. The dealer's number is required to be listed on all shellfish tags and labels to indicate that the shellfish has originated from a certified facility.

Shellfish dealers shipping products into interstate commerce are required to meet the requirements of the NSSP and must be certified for listing on the Interstate Certified Shellfish Shippers List.

In advance of processing/shipping, growers/producers would be required to obtain a Processed Food Registration and a Shellfish Handling and Marketing Certificate from the CDPH's FDB.

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In addition, prior to entering product into interstate commerce, producers are required to meet the requirements of the NSSP and must be certified for listing on the Interstate Certified Shellfish Shippers List.

- **Data Required to Obtain a Handling and Marketing Certification**
 - Description of the type and location of any facilities to be used for handling, packaging, or storing the aquaculture products within the state.
- **Analysis Required:** Analysis completed under this certification is for subsequent approval of facilities, equipment, and procedures used for handling, shucking, storing, packaging, and shipping of fish and shellfish after harvest. This certification also enforces meat quality standards and sets requirements for proper packaging and labeling of all fish and shellfish moved in commerce.
- **Timeline:** Typically a year from submittal.
- **Fees:** None.

The California Shellfish Handling and Marketing Certificate Application can be found online at <https://www.cdph.ca.gov/CDPH%20Document%20Library/ControlledForms/cdph8642.pdf>.

2.3 NEPA Requirements

NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. The range of actions covered by NEPA includes making decisions on permit applications, adopting federal land management actions, and constructing highways and other publicly owned facilities. Under NEPA, federal agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations. NEPA requires federal agencies to incorporate environmental considerations in their planning and decision making through a systematic interdisciplinary approach. All federal agencies must prepare detailed statements assessing the environmental impact of and alternatives to major federal actions affecting the environment. These statements are in the form of an Environmental Assessment and/or an environmental impact statement.

The Corps is likely to be the lead federal agency for the Project's NEPA document. It is anticipated that the Corps will require an Environmental Assessment-level assessment.

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2.4 Permits Not Required

- Clean Water Act 404 Permit – not required because the project will not result in a discharge of dredged or fill material into waters of the United States.
- Clean Air Act Title V Permit – not required because shellfish processing will use pre-existing infrastructure.
- Hazardous Waste ID Number – not required because no hazardous waste will be generated.
- NPDES 402 Stormwater Permit – not required because there will not be a discharge of pollutants to surface waters resulting from the lease areas.
- State of California permits including California Fish and Game Commission aquaculture leases, California Department of Public Health growing area certificates, Coastal Commission Coastal Development Permit, or California Department of Fish and Wildlife California Endangered Species Act incidental take permits – not required because the Project is located outside of state of California waters.

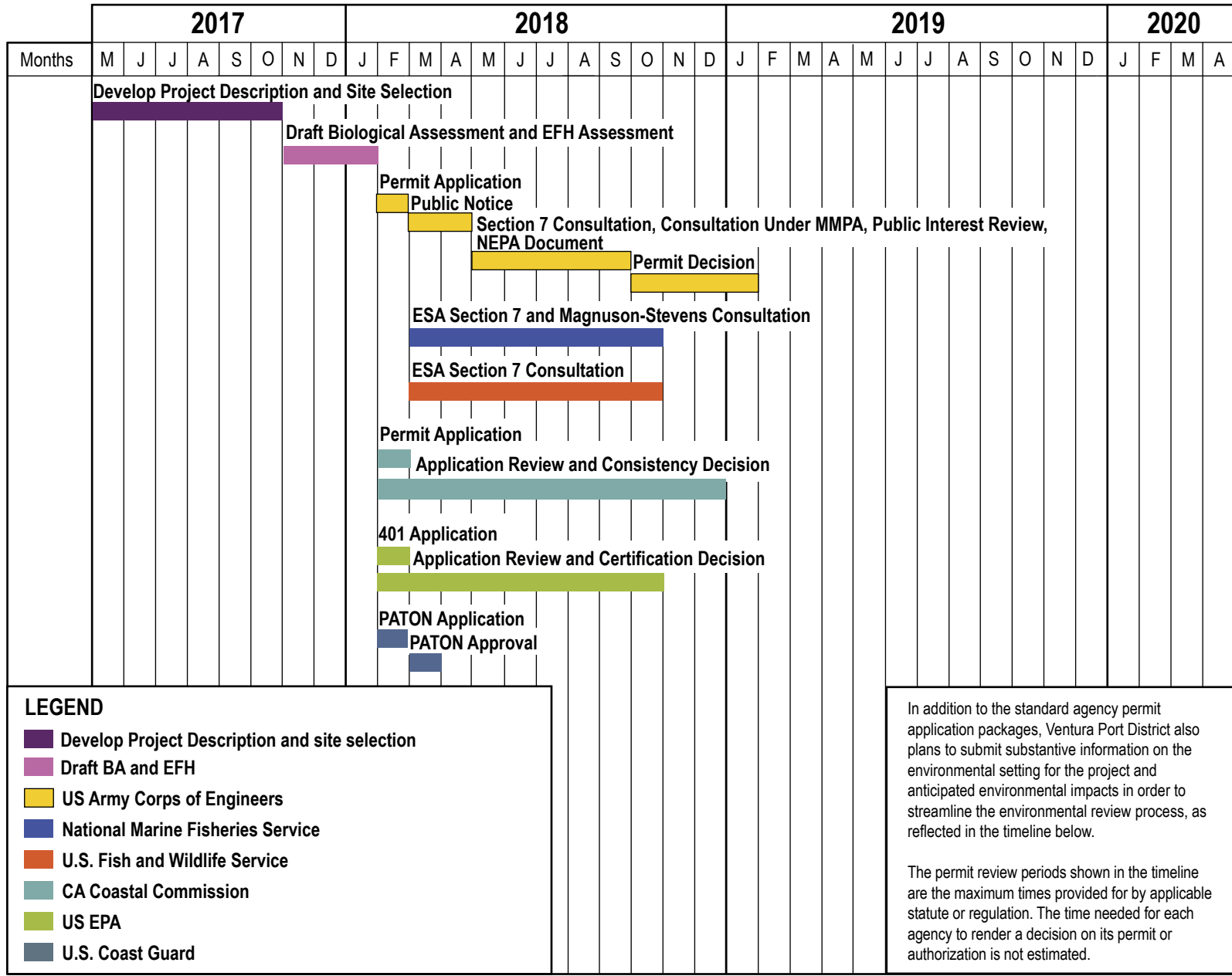
2.5 Permit Application Sequencing and Critical Path

The overall timeline for obtaining all required permits is expected to be up to 2 years. The process follows a simple sequence: engaging regulatory agencies and gathering data at Project development stage; generating a complete Project description; and submitting permit applications concurrently to all regulatory agencies for required permits (see Figure 6, Ventura Shellfish Enterprise Permit Application Sequencing Timeline).

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Ventura Shellfish Enterprise Permit Application Sequencing Timeline



SOURCE: Dudek

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3 KEY TECHNICAL ISSUES AND INFORMATION NEEDED TO ADDRESS KEY ISSUES

In order to procure all required permits to proceed, the proposed project must address potential impacts and fully comply with the suite of applicable regulations. We have identified the following considerations as Key Issues in the approval process for the proposed Project and shellfish aquaculture in general. Approvals by the various regulatory agencies will require evaluating alternatives with regard to these Key Issues in order to minimize adverse environmental effects of the Project. Table 3 summarizes the Key Issues and potential levels of impact by category, and each issue is described in further detail following the table.

Table 3
Key Issues and Potential Levels of Impact

Issue	Level of Potential Impact
<i>Biological Issues</i>	
Release of viable nonnative reproductive material by cultivated specimens	Low
Release of potentially invasive species, parasites and pathogens from seed stock	Low
Removal of phytoplankton from the water column	Low
Effects of equipment on water column habitat	Low
Construction impacts on the seafloor	Low to medium
Deposition and accumulation of biological materials on the seafloor during operation	Low to medium
Invasive fouling organisms	Medium
Potential for ship strikes of marine wildlife	Low
Potential for marine mammal entanglement in aquaculture gear	Low to medium
<i>Navigational Issues</i>	
Project effects on navigational safety	Low
<i>Air Quality Issues</i>	
Increased air emissions from boat trips to construct and operate the project	Low
<i>Product Quality Issues</i>	
Potential for domoic acid accumulation in cultivated shellfish from natural algae blooms	Low
<i>Vibrio</i> contamination of cultivated shellfish	Low
<i>Social Impact Issues</i>	
Potential economic impact on existing fisheries, specifically halibut trawling	Medium
Damage to fishing gear due to contact with aquaculture equipment	Low to medium
Onshore aesthetic impacts of surface equipment (buoys, navigation aids, etc.)	None to low

For each of the following issues, data will be required to describe the existing conditions, potential project impacts, and potential cumulative impacts.

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3.1 Biological Issues

3.1.1 Cultivation of Non-Native Species

The proposed project would involve the cultivation and harvest of the Mediterranean mussel (*Mytilus galloprovincialis*). The Mediterranean mussel is a non-native species but has already established naturalized, self-sustaining populations outside of cultivation in California. The California Department of Fish and Wildlife (CDFW) does not consider the Mediterranean mussel an invasive species in California.

Issue A: Release of Viable Nonnative Reproductive Material by Cultivated Specimens

Cultivation of Mediterranean mussels has the potential to lead to the spread of this non-native species outside of cultivation if viable eggs, larvae, or other reproductive material are released into the ocean system. Subsequent competition with and displacement of native shellfish species is the primary concern related to release of reproductive material. However, the Project area appears to lack suitable substrate for development of natural Mediterranean mussel populations and there are no native shellfish populations in the Project area or in Ventura Harbor that could be negatively impacted. Because the Mediterranean mussel is already so pervasive in California waters, the additional reproductive material released by the proposed Project may not have any appreciable effect on the spread of the species.

- **Permits/Entitlements Implicated**

- Consultation with the National Marine Fisheries Service (NMFS) pursuant to Endangered Species Act (ESA) Section 7, Marine Mammal Protection Act, Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act), and the Wildlife Coordination Act
- California Coastal Commission (Coastal Commission) federal consistency review pursuant to the Coastal Zone Management Act (CZMA)

- **Information Needs**

- Data regarding the nearest known existing occurrences of Mediterranean mussel and baseline conditions
- Amounts of potential release of eggs and larvae from the Project
- Potential for dispersion based on ocean currents
- Identification of suitable substrate and any native shellfish populations that could be affected

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Issue B: Release of Potentially Invasive Species, Parasites, and Pathogens from Seed Stock

Shellfish aquaculture has the potential to introduce invasive species, parasites, and pathogens into the environment via seed stock, which could have detrimental impacts on the marine ecosystem. The risk of such introductions can be minimized by ensuring shellfish seed are imported from sources with rigorous QA/QC for invasive species and that are certified to be disease and parasite free.

- **Permits/Entitlements Implicated:**
 - CDFW importation permit
- **Information Needs:** Importation permit demonstrating that the seed stock will come from a hatchery that is certified as disease and parasite free

3.1.2 Water Column Effects

The Project has the potential to affect habitat within the water column, including habitat for pelagic fish species.

Issue A: Removal of Phytoplankton from the Water Column

Mussels, including the Mediterranean mussel, are filter feeders that feed primarily on phytoplankton from the water column. In large enough numbers, cultivated mussels have the potential to affect the abundance and diversity of phytoplankton in the vicinity of aquaculture operations. A decrease in phytoplankton can lead to subsequent decreases in the zooplankton species that feed on phytoplankton and the fish species that feed on plankton in the water column. The Project's location in open offshore waters reduces the likelihood that a localized decrease in phytoplankton will occur, because the currents and movement of water in the open ocean should ensure a sufficient mixing and turnover of water.

- **Permits/Entitlements Implicated**
 - Consultation with NMFS pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
 - Coastal Commission federal consistency review pursuant to the CZMA
- **Information Needs**
 - Data regarding the baseline abundance of plankton in the vicinity of the Project area
 - Phytoplankton consumption rate for mussels

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- Potential for mixing of waters characterized by water movement velocity and depth in the Project area

Issue B: Effects of Equipment on Water Column Habitat

The aquaculture equipment associated with the Project, particularly the submerged lines and cultivation ropes, would serve as a new source of water column habitat not otherwise present in the open ocean. The new surface area created by the equipment has the potential to function as foraging habitat and refuge areas for pelagic fish species. This type of beneficial effect would be an important consideration in favor of locating the Project in open ocean waters.

- **Permits/Entitlements Implicated**

- U.S. Army Corps of Engineers (Corps) Permit pursuant to Section 10 of the Rivers and Harbors Act of 1899
- Consultation with NMFS pursuant to ESA Section 7, Marine Mammal Protection Act, Magnuson-Stevens Act, and the Wildlife Coordination Act
- Coastal Commission federal consistency review pursuant to the CZMA

- **Information Needs**

- Data regarding the baseline abundance of pelagic fish in the project vicinity

3.1.3 Benthic Community

The proposed project would be located above sandy bottom sea floor in offshore open ocean waters. The benthic community in the project area is likely to contain a limited number of epifaunal species and a much larger number of infaunal species. The Project has the potential to impact the benthic environment through both placement of the proposed anchors and through the accumulation of biological material generated by shellfish cultivation.

Issue A: Construction Impacts on the Seafloor

Seafloor habitat could be altered or disturbed by the placement of the anchoring apparatus (e.g., screw anchors) used to hold the lines, ropes, floats, and buoys of the cultivation lines in place. The Corps will not consider the anchors as “fill” but will regulate the apparatus as a “structure” and regulate its placement as “work.”

- **Permits/Entitlements Implicated**

- Corps Permit pursuant to Section 10 of the Rivers and Harbors Act of 1899

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- Consultation with NMFS pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
- Coastal Commission federal consistency review pursuant to the CZMA
- **Information Needs**
 - Detailed plans describing and depicting the type, amount, layout, and method of installation of the facility, specifically the anchoring apparatus
 - Data regarding the baseline abundance and diversity of epifaunal and infaunal species beneath the proposed anchoring areas

Issue B: Deposition and Accumulation of Biological Materials on the Seafloor during Operation

Seafloor habitat can be altered or disturbed by the deposition of biological materials resulting from dislodged or discharged shells, shell fragments, and deposits from the growing operation accumulating on the seafloor beneath the structure. Such material typically includes feces and pseudofeces from the cultivated shellfish, as well as fouling organisms such as algae, barnacles, sponges, and other species of shellfish that accumulate on the Project equipment and subsequently become dislodged by natural processes, or due to harvesting or cleaning operations. Cultivated shellfish or shells from the Project can also be dislodged from the structure during growth, storm events, predation by marine wildlife, cleaning, and harvest activities.

The accumulation of material including shell fragments, intact shells, fouling organisms, and feces can alter the physical and chemical characteristics of the bottom substrate, and can impact the benthic community and sediment-dwelling organisms that may be sensitive to conditions such as substrate composition and chemistry. Accumulation of material could also attract organisms that would change the composition of the benthic community.

- **Permits/Entitlements Implicated**
 - Coastal Commission federal consistency review pursuant to the CZMA
 - Consultation with NMFS pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
- **Information Needs**
 - Analysis of baseline and potential seafloor habitat debris composition

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3.1.4 Fouling Organisms (*Didemnum*)

The submerged structures of open water shellfish farms can provide hard substrate habitat for invasive “fouling organisms.” Fouling organisms, such as invasive algae, sea squirts, and mussels, pose economic and ecological risks to the marine environment. A species such as *Didemnum vexillum* is worthy of considerable attention as a nuisance species because it reproduces rapidly and fouls marine habitats (including shellfish aquaculture operations and fishing grounds), ship’s hulls, and maritime structures. It can interfere with coastal and offshore activities. Like other fouling organisms, they are found on hard substrates that include floats, moorings and ropes, steel chain, automobile tires, polythene plastic, rock outcrops, gravel seabed (pebbles, cobbles, boulders), and ship hulls. They overgrow other marine organisms such as tunicates, sponges, macro algae, hydroids, anemones, bryozoans, scallops, mussels, and oysters. Where these colonies occur on the seabed, they likely cover the siphons of infaunal bivalves and also serve as a barrier between demersal fish and benthic prey. The colonies can occur at water depths ranging from intertidal to continental shelf depths of 65 meters (213 feet).

Issue A: Attraction of Fouling Organisms on Aquaculture Gear

- **Permits/Entitlements Implicated**
 - Coastal Commission federal consistency review pursuant to the CZMA
 - NMFS consultation pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
- **Information Needs**
 - An evaluation of the diversity, abundance, and distribution of fouling organisms that could potentially establish on the shellfish cultivation facility (e.g., ropes, buoys, cables, cultivation structures, and cultivated shellfish)
 - A list of maintenance actions for in-water structures and vessels that involve the periodic removal of fouling organisms with proper collection and disposal protocols
 - Analysis of the abundance/distribution of non-native fouling organisms, and evaluation of the response of fish, macro invertebrate, seabird, and marine mammal populations in the Project area to the presence of the facility’s bio fouling organisms
 - An upland disposal plan for non-native fouling organisms when conducting maintenance cleaning operations

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3.1.5 Marine Wildlife

The proposed Project would be located in open ocean waters that are used by numerous marine species, including marine mammals and sea turtles. Marine mammal species that could be present in the Project area include gray whales (*Eschrichtius robustus*), blue whales (*Balaenoptera musculus*), humpback whales (*Megaptera novaeangliae*), Dall's porpoises (*Phocoenoides dalli*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), common dolphins (*Delphinus delphis*), California sea lions (*Zalophus californianus*), and harbor seals (*Phoca vitulina*). Two species of sea turtle, green sea turtles (*Chelonia mydas*) and leatherback turtles (*Dermochelys coriacea*), could also be present. The Project has the potential to adversely affect marine wildlife via collisions with Project boats and entanglement in lines and aquaculture equipment.

Issue A: Potential for Ship Strikes due to Increased Boat Activity

Ship strikes are known to be a hazard to a number of marine species with the potential to occur in the Project vicinity, including several species of whale. The Project would contribute to increased boat traffic in the area during both Project construction and regular operations. Mortality from collision with marine vessels is often associated with larger container and freight ships; however, collisions with smaller boats such as those that would be used for the proposed Project do have the potential to kill or injure marine mammals.

- **Permits/Entitlements Implicated**
 - Coastal Commission federal consistency review pursuant to the CZMA
 - NMFS consultation pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
- **Information Needs**
 - List of species with the potential to occur in the Project area and survey data if available
 - Information regarding the size and number of vessels to be used during Project construction
 - Information regarding the size and number of vessels to be used during regular Project operations, such as seeding, harvesting, and maintenance of facilities and the frequency/number of trips
 - Existing use of the area by ships (size, frequency)

Issue B: Potential for Marine Mammal Entanglement in Aquaculture Gear

Marine mammal entanglement in fishing gear is considered a major cause of injury and mortality for marine mammals, particularly when a large number of lines and ropes are used and the lines and ropes have a small diameter and are slack. Each of these factors can create a potential for entanglement.

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Additional risk is posed by the potential for aquaculture facilities to trap derelict fishing gear, lines, and debris that could separately create the potential for entanglement if not properly managed and removed.

Few quantitative data are available regarding the risks of commercial aquaculture facilities located in offshore open ocean waters, particularly in California. A mussel aquaculture operation located off the coast of Santa Barbara is the nearest similar facility to the proposed Project, and that operation has never recorded an instance of marine mammal entanglement in more than a decade of operations.

The design of each of the facilities currently proposed consists of cultivation ropes suspended from a long line submerged 15 to 45 feet beneath the water surface. The configuration consists of a horizontal header line that is supported by buoys and vertical lines that anchor the longline to the bottom of the ocean, as shown on Figure 3. The long line configuration produces a fairly rigid structure under tension, with stout lines and little slack. Unlike fishing lines and nets, shellfish longlines are not intended to catch fish or marine mammals. Therefore, the Project design is expected to pose a much smaller risk to marine mammal entanglement compared to long line fishing methods.

- **Permits/Entitlements Implicated**
 - Coastal Commission federal consistency review pursuant to the CZMA
 - NOAA consultation pursuant to ESA Section 7, the Marine Mammal Protection Act, the Magnuson-Stevens Act, and the Wildlife Coordination Act
- **Information Needs**
 - List of species with the potential to occur in the Project area and survey data if available

3.2 Navigational Issues

Offshore shellfish cultivation facilities can pose a risk of collision or entanglement to ocean-based vessel traffic and activities such as whale watching, sailing, and fishing. Marker buoys placed at the corners of the facility demarcate the boundaries, and the actual cultivation structures would be submerged to a depth of 15 to 45 feet, below the draft of most vessel traffic outside of shipping lanes. With proper facility design, installation, location information, and in-water navigational demarcation, vessel traffic through an offshore shellfish cultivation facility can be properly managed.

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Issue A: Project Effects on Navigational Safety

- **Permits/Entitlements Implicated**
 - U.S. Coast Guard pursuant to U.S. Private Aids to Navigation System
 - Corps Section 10 Rivers and Harbors Act Permit
 - Coastal Commission federal consistency review pursuant to the CZMA
- **Information Needs**
 - Marker buoy type, size, and layout design to assist implementation of a navigation system
 - Facility structure layout plans to aid in analysis of collision or entanglement risk to vessel traffic
 - Location and configuration information to allow information transfer to navigational charts

3.3 Air Quality Issues

Issue A: Increased Air Emissions from Boat Trips to Construct and Operate the Project

The proposed Project has the potential to impact air quality, primarily through emissions generated by additional boat trips to and from the Project site for construction, operation, and maintenance of the aquaculture facilities, as well as additional vehicle traffic generated by the Project and operation of harvesting equipment.

- **Permits/Entitlements Implicated**
 - Corps Permit Public Interest Review, pursuant to Section 10 of the Rivers and Harbors Act of 1899
- **Information Needs**
 - Information regarding the number of vessels to be used during Project construction, duration of construction, and estimate of resulting emissions
 - Information regarding the number of vessels to be used during regular Project operations, such as seeding, harvesting, and maintenance of facilities; frequency/number of trips; and estimate of resulting emissions
 - Expected vehicle traffic generated by the Project
 - Existing use of the area by ships; baseline emissions

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3.4 Product Quality Issues

3.4.1 Domoic Acid

Domoic acid is a biological toxin produced by members of the phytoplankton genus *Pseudo-nitzschia*. When environmental conditions cause these phytoplankton to bloom in excessive concentrations, domoic acid can accumulate in the environment and become highly concentrated in filter-feeding organisms and higher trophic levels of the marine food chain. It can be harmful to humans if shellfish contaminated with domoic acid is consumed.

Issue A: Potential for Domoic Acid Accumulation in Cultivated Shellfish from Natural Algae Blooms

- **Permits/Entitlements Implicated**
 - National Shellfish Sanitation Program (NSSP) guidelines and NOAA-SIP protocol
- **Information Needs**
 - General growing area information and analysis geared towards understanding water quality and impacts
 - Detailed location information (with written authorization for that location), sanitary survey, and monitoring protocol for water quality and marine biotoxins to set rules for harvest closures and to develop a management strategy
 - A plan that identifies law enforcement agency patrol support when in the closed status (due to a product quality issue such as domoic acid) to deter illegal harvesting

3.4.2 *Vibrio*

Vibrio is a genus of Gram-negative bacteria. Several species of *Vibrio* are pathogens. Most disease-causing strains are associated with gastroenteritis in humans, but they can also infect open wounds and cause septicemia, leading to fatality. *Vibrio* can be carried by numerous marine organisms, including shellfish.

Issue A: *Vibrio* Contamination of Cultivated Shellfish

- **Permits/Entitlements Implicated**
 - National Shellfish Sanitation Program (NSSP) guidelines and NOAA-SIP protocol

Strategic Permitting Initiative to Substantially Increase Shellfish Farming in Southern California

- **Information Needs**

- General growing area information and analysis geared towards understanding water quality and impacts
- Detailed location information (with written authorization for that location), sanitary survey, and monitoring protocol for water quality and marine biotoxins to set rules for harvest closures and to develop a management strategy
- A plan that identifies law enforcement agency patrol support when in the closed status (due to a product quality issue such as *Vibrio*) to deter illegal harvesting

3.5 Social Impact Issues

3.5.1 Commercial Fishing

The proposed Project has the potential to impact certain commercial fishing operations; however, the updated proposed project location has been selected in an effort to minimize any such impacts, particularly to California Halibut fishing.

Issue A: Potential Economic Impact on Existing Fisheries

The Project's location in offshore open ocean waters has the potential to preclude certain commercial and recreational fishing operations and activities that utilize federal waters.

- **Permits/Entitlements Implicated**

- Corps Permit pursuant to Section 10 of the Rivers and Harbors Act of 1899
- Coastal Commission federal consistency review pursuant to the CZMA

- **Information Needs**

- Current use of the Project area by commercial fishing operations.

Issue B: Damage to Fishing Gear due to Contact with Aquaculture Equipment

The Project has the potential to damage commercial and recreational fishing gear should the gear come into contact with the aquaculture facilities and become entangled. The result of entanglement could be damage to or even loss of the fishing gear, which could have an adverse economic impact on fishermen. Clear demarcation of all lease areas and aquaculture configurations with surface highflyer buoys will minimize collisions and associated gear damage.

- **Permits/Entitlements Implicated**

- Corps Permit pursuant to Section 10 of the Rivers and Harbors Act of 1899

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- Coastal Commission federal consistency review pursuant to the CZMA
- **Information Needs**
 - Locations of lease areas and current fisheries operations
 - Amount of recreational fishing in the lease areas

3.5.2 Aesthetics

Issue A: Onshore Aesthetic Impacts of Surface Equipment (Buoys, Navigation Aids, etc.)

The proposed Project site would be located in offshore waters and would likely not be visible to observers from the shoreline. The majority of equipment involved in longline mussel aquaculture is located beneath the surface. Above-surface equipment would consist of buoys, floats, and navigational aids that would be used to identify the location of the cultivation plots for vessels to prevent collisions or entanglement of gear. The potential for aesthetical conflicts is likely to be minimal.

- **Permits/Entitlements Implicated**
 - Corps Permit Public Interest Review pursuant to Section 10 of the Rivers and Harbors Act of 1899
 - Coastal Commission federal consistency review pursuant to the CZMA
- **Information Needs**
 - Visual layout of surface markers and buoys associated with specific lease locations

Strategic Permitting Initiative to Substantially Increase Shellfish Farming in Southern California

4 REFERENCES CITED

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- NOAA (National Oceanic and Atmospheric Administration). 2008. “Gear Modification Techniques for Complying with the Atlantic Large Whale Take Reduction Plan (ALWTRP).” Effective April 5, 2008. https://www.greateratlantic.fisheries.noaa.gov/nero/hotnews/whalesfr/Gear%20Modification%20Techniques%20for%20Complying%20with%20the%20ALWTRP_vs8.pdf.
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Strategic Permitting Initiative to Substantially Increase Shellfish Farming in Southern California

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APPENDIX A

*Agency Comments Received during Regulatory
Pre-Application Meeting*

APPENDIX A

Agency Comments Received during Regulatory Pre-Application Meeting

Document Location	Name	Comment/Issue
1.4, Project Location	Chris Yates (NOAA)	Suggest having the Bren School model incorporate factors that the permitting agencies suggest as screening criteria. Make sure the model is answering the questions of the permitting agencies.
1.5.3, Protected Species Conservation Measures	Bryant Chesney (NOAA)	Fully describe conservation measures and point to recent studies and anecdotal evidence that supports this design and shows how issues can be managed.
2.1.3, NOAA National Marine Fisheries Service	Penny Ruvelas (NOAA)	Include full list of listed species that could occur.
2.1.3, NOAA National Marine Fisheries Service	Bryant Chesney (NOAA)	Consider reaching out to Pacific Fisheries Management Council regarding their Essential Fish Habitat responsibilities.
2.1.3, NOAA National Marine Fisheries Service	Penny Ruvelas (NOAA)	Consider variety of other effects and concerns beyond just the location of the lines in the water. For example, need to consider entire scope of project, including impact of having 20 or more sites, how the ropes and lines are configured in the water, harvesting activities, boat traffic, etc.
2.3.2, California Department of Fish and Wildlife	Loni Adams (CDFW)	Consider California least terns could potentially be impacted as they forage in Ventura Harbor.
Table 3, Key Issues and Potential Levels of Impact	Penny Ruvelas (NOAA)	For ESA/MMPA, focus is at site specific level. But also need to consider density and siting/location of structures; where sites are located relative to one another. Make sure there isn't a creation of migratory barriers or mazes for species moving through. Also think about MMPA stocks – dolphin or porpoise stocks that have a restricted range; make sure not narrowing with dense placement within 100 acre plots.
Table 3, Key Issues and Potential Levels of Impact	Chris Yates (NOAA)	Don't want to set up a curtain or migratory barrier for gray whales, for example.
Table 3, Key Issues and Potential Levels of Impact	Bryant Chesney (NOAA)	Think of other indirect impacts such as Port infrastructure expansion's effects if creating a large commercial enterprise.
Table 3, Key Issues and Potential Levels of Impact	Cassidy Teufel (CA Coastal Commission)	Marine debris can be a biological issue and also have commercial impacts. Facilities themselves can break loose and become marine debris. And if fishing is allowed nearby, fishing gear can become entangled and lost.
Table 3, Key Issues and Potential Levels of Impact	Chris Yates (NOAA)	Consider gear marking requirements so there is a confident system of marking and way of identifying if pieces get lost.
Table 3, Key Issues and Potential Levels of Impact	Cassidy Teufel (CA Coastal Commission)	On water operations and use of lighting – protected sea bird species can be sensitive to light attraction. If there are on-water operations at night, effects of use of lighting should be considered depending on location and how far offshore.
Table 3, Key Issues and Potential Levels of Impact	Cassidy Teufel (CA Coastal Commission)	May need to consider effects of on-water operations at night (light effects) as aesthetic or visual impacts, depending how far offshore.

APPENDIX A (Continued)

Document Location	Name	Comment/Issue
3.5, Social Impact Issues – 3.5.1, Commercial Fishing	Mike McCorkle	Fishermen already concerned about being squeezed in. Have had bad luck with CDFW; leases are still there that were never removed and not marked. Gray whales need to be included in list of species moving through. Would support a project inside of one mile. Sites have to be well marked and monitoring needs to happen. Put pingers on leases to warn whales. Need a bond to ensure there's clean up if growers walk away. Need criteria in place/ vetting process for who can get a lease. Concerned about unmaintained gear and no enforcement from the agencies. Fishermen need to know where the sites are and they need to be clearly marked.

APPENDIX B

Agency Comments Received on Draft Strategic Permitting Plan

APPENDIX B

Agency Comments Received on Draft Strategic Permitting Plan

Document Location	Name	Comment/Issue
1.2, Project Summary	Bryant Chesney (NMFS)	Regarding the project “providing habitat for important species” – This is a tenuous Project benefit. I'd suggest deleting unless the VPD is willing to dedicate resources to verification of this benefit.
Figure 1, Location of Project	Brian Bugsch (State Lands Commission)	Based on the information provided and a review of in-house records, staff has determined jurisdiction in the Pacific Ocean within the Project areas is as follows: a. The very northern portion of the candidate area may contain lands granted to the County of Santa Barbara pursuant to Chap. 846, Stats. 1931 and as amended; and lands granted to the City of Carpinteria pursuant to Chap. 1044, Stats. 1968 and as amended; b. The very southern end of the candidate area may contain lands granted to the City of San Buenaventura pursuant to Chap. 213, Stats. 1935; and c. Ungranted sovereign land. Additionally, the Commission has identified a number of leases within the candidate area (see enclosed map). Please note that the map illustrates the general location of the legislative grants and existing leases in the area. It is not to be used to depict actual boundaries. The location, type of facility, and status of these leases may affect or constrain the suitability of the area for aquaculture; please contact Al Franzoia, Public Land Management Specialist (listed below) to discuss site compatibility and Commission jurisdiction as site selection proceeds.
1.4, Project Location	Bonnie Rogers (Corps)	Provide a rationale describing how the design, twenty plots each 100-acre, was decided, versus fewer plots or another permutation. Discuss relevant explanations such as production or productivity of culture and/or cost considerations. Describe avoidance and minimization measures to waters and other relevant public interest factors which were incorporated and considered as part of the planning process.
1.4, Project Location	Cassidy Teufel (Coastal Commission)	Please consider describing how/why 20 100-acre sites were selected as optimal for this project. Were other numbers and sizes considered and rejected? Please consider including the specific information from the constrains analysis used to select the proposed project location. While this information is described generally, figures or graphics showing the specific constrains that were considered and the references or sources of the data used to develop them would be helpful.
1.5, Project Approach	Loni Adams (CDFW)	A conceptual model would be very helpful to visualize how the long lines look under water (3D model) for the preferred 20 designed aquaculture locations. The model should indicate how the equipment design, distances, depths and locations will avoid and minimize impacts to water quality, plankton, marine life, marine habitat, fragmentation of habitat, fish and wildlife migrations, foraging grounds, spawning grounds, accessing river mouth or estuary, and the fishing industry as well as air pollution emissions.
1.5.2, Project	Cassidy Teufel (Coastal	Please describe the entity that would carry out the installation of

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
Construction	Commission)	the cultivation structures – would it be the Port or individual operators? If it is the latter, how would the Port ensure that the exact type and configuration of equipment described in the document would be selected and used? While the backbone system and helical anchors are one method, there are many others that could be used as well.
1.5.3, Protected Species Conservation Measures	Bryant Chesney (NMFS)	Regarding reference to NMFS 2016 Programmatic Biological Opinion – NMFS BO for Washington State covers a much different seascape (protected embayments in northern latitude vs offshore open coast in southern latitude), so the comparison isn't entirely appropriate. Marine mammal and sea turtle entanglement risk is greater in the Santa Barbara Channel than in the bay and estuarine areas covered by the references NMFS 2016 Biological Opinion for Washington shellfish culture NWP 48.
1.5.4, Best Management Practices	Cassidy Teufel (Coastal Commission)	The document notes that CDFW would be tasked with enforcement and compliance responsibilities. Please clarify is this something CDFW supports and has funding and resources to accomplish.
1.5.4, Best Management Practices	Loni Adams (CDFW)	Although data and monitoring information exists for shellfish aquaculture BMP's located in Washington state, eastern U.S. coast and New Zealand, we have limited information for the California coast and none for Ventura County specifically. Southern California marine life is a unique biological and oceanographic environment that will likely require location-specific development of BMP's for VSE operations as it relates to local coastal and marine impacts avoidance and minimization. VSE should verify that their initial proposed BMP's are effective after initial implementation. Adjustments, additions and deletions to the initial BMPs and methodologies can be made as recommended by research or monitoring. The following additional potential issues should be identified and considered for potential monitoring if necessary: a. Measurement of planktonic content in water column baseline and during full capacity operation of the research parcel. Develop a carrying capacity threshold to the extent feasible. b. Identify seabird uses of the proposed locations. Impacts to endangered/threatened seabirds or fish (e.g. Southern steelhead) and fully protected seabirds (e.g. California least terns) should be fully addressed in the bio-assessments. c. Identify potential impacts to commercial/recreational important fish and their foraging/spawning areas. d. Identify impacts to native fish/invertebrate community composition and if any significant changes seen, develop measures to avoid or minimize changes. e. Identify sensitive or locally rare marine fish and invertebrate populations and fully address the potential impacts if any.

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
Table 2, VSE BMPs	Loni Adams (CDFW)	The Best Management Practices (BMP's) shown in Table 2, page 17 of the strategic permitting plan are a good start, but based on the biological and impact assessments that are to be conducted in the future, additional BMP's will likely need to be added. I recommend developing BMP's as applicable for the following issues: a. Anchoring system best design and practices to minimize benthic and water column habitat and marine life disturbances. b. Seabird protection plans. c. Handling procedures to minimize the debris accumulation and spread of fouling and non-native species on equipment and on the benthic habitat. d. Fouling gear entanglement contingency plan. Fishing boat and fishing equipment damages caused by VSE aquaculture operations should be handled by a pre-approved contingency plan in the event that it does occur.
1.5.5, Monitoring Program	Loni Adams (CDFW)	Development of marine impact monitoring, mitigation and reporting plans for the initial construction and ongoing VSE operation is recommended for each of the 20 parcels. This should include a method to measure and analyze not only impacts within one parcel, but also the cumulative impacts for the 2000-acre area as a whole.
2.1.1, U.S. Army Corps of Engineers	Bonnie Rogers (Corps)	The scale of the proposed project, to install twenty 100-acre plots (totaling 2,000 acres if contiguous) in Section 10 waters, within State boundaries, has the potential to result in more than minimal effects to navigation, Essential Fish Habitat (EFH), or public interest factors. Therefore, the project may or may not qualify for Nationwide Permit 48 (commercial shellfish). If an individual permit is required due to more than minimal project effects, a NEPA alternatives analysis would be required for Section 10 work, but a Section 404(b)(1) alternatives analysis would not be required if no discharge of fill is proposed. Based on the information submitted, it appears the project would not result in a discharge of fill material because the project components include only Section 10 work structures (anchors, lines, buoys).
2.1.3, NOAA National Marine Fisheries Service	Bryant Chesney (NMFS)	In Timing subsection, "USFWS" should be replaced with "NMFS." Regarding Letter of Authorization Process – See the following website for more info on MMPA LOAs: http://www.nmfs.gov/pr/permits/incidental/ .
2.3, California Coastal Commission	Cassidy Teufel (Coastal Commission)	The references to the Commission's federal consistency process and authority should be removed. For a project in state waters like this, that information really isn't relevant and is likely to cause confusion. If you instead choose to retain those references, please let me know and I'll work with you to identify statements that need to be corrected.
2.3.1, California Fish and Game Commission	Brian Bugsch (State Lands Commission)	Page 29 of the Strategic Permitting Plan indicates, " <i>the Fish and Game Commission has exclusive jurisdiction over all ungranted tidelands and submerged lands</i> " pursuant to the Submerged Lands Act of 1953. This reference is erroneous and should be deleted, as the Submerged Lands Act pertains to oil and gas exploration, and the State, via the State Lands Commission, rather

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
		than the Fish and Game Commission, administers and manages ungranted tidelands and submerged lands.
2.3.5, California State Lands Commission	Brian Bugsch (State Lands Commission)	As noted in the Strategic Permitting Plan, unlike other types of projects and facilities, where the Commission has jurisdiction over leasing in state waters, aquaculture leases are issued and managed by the California Fish and Game Commission, pursuant to the Fish and Game Code (§§ 15400-15415). Because the Fish and Game Commission may only authorize an aquaculture lease if it determines the lease is in the public interest, does not interfere with Public Trust values, and does “not unreasonably impede public access to state waters for purpose of fishing, navigation, commerce, or recreation” (§ 15411), Commission staff recommends the VSE coordinate throughout the process, as indicated in Figure 3, sequencing timeline (p. 51) of the Strategic Permitting Plan. Such coordination is particularly important to ensure the Project does not substantially interfere with the Public Trust needs and values in the area and that other lessees are not impacted.
2.3.6, California State Office of Historic Preservation	Brian Bugsch (State Lands Commission)	Commission staff recommends addition of Tribal Resources Issues to Section 3 of the Strategic Permitting Plan. California Native American Tribes associated with the Santa Barbara coastal area include the Santa Ynez Band of Mission Indians, Coastal Band of Chumash Nations, and Barbareño/Ventureño Band of Mission Indians. These Tribes, and possibly others, have a long history of cultural affinity and use of the marine environment and may consider locations, features, and landscapes within the candidate area to be Tribal cultural resources of significance to their people. In addition, the lead agency for the Project under the California Environmental Quality Act will need to comply with the Tribal Consultation and resource avoidance provisions enacted via Assembly Bill 52 as part of the environmental review and approval process. As a result, staff recommends early and ongoing coordination with Tribes, and recommends the addition of Tribal coordination to Figure 3, beginning at month one of year one and continuing throughout the process. Any submerged archaeological site or submerged historic resource that has remained in State waters for more than 50 years is presumed to be significant. Title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in California’s tide and submerged lands may be vested in the State and could be under the Commission’s jurisdiction (Pub. Resources Code, §6313). While the Strategic Permitting Plan states that individual sites will be selected to ensure they are located on areas of sandy bottom, the location of many archaeological and historical resources remain unknown. The potential for submerged resources to be present should be taken into consideration during the site selection process and investigations should be conducted, potentially including seafloor geophysical surveys, prior to affixing any anchoring or other structures to the seafloor. Please be advised the Commission has exclusive jurisdiction over geophysical and geological surveys in state waters and such activities require a permit from the Commission prior to their conduct.

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
Figure 3, VSE Permit Application Sequencing Timeline	Cassidy Teufel (Coastal Commission)	Please note that before a coastal development permit can be filed and processed, proof of landowner authorization must be provided. For this project, that proof would be an approved lease (or leases) from the Fish and Game Commission. Accordingly, the permitting timeline in Figure 3 should be amended so that the end of the Fish and Game Commission process corresponds with the permit application process for the Coastal Commission. As currently structured, these two processes are largely parallel.
3.1, Biological Issues	Bonnie Rogers (Corps)	Submit an EFH assessment (see attached new EFH template guidance letter) describing potential effects. Include a substrate map showing the most proximate hard bottom substrate or other closest complex habitat features. Discuss the potential dispersal direction of shellfish deposition and organic material from the project by discussing local current and flow patterns, and the potential effect to nearby key resources such as hard substrates/complex habitat. Address fouling/invasive-species settling and associated maintenance plans. The scale and cultivation of this non-native but naturalized species, Mediterranean mussel, for the first time should be discussed further, including a discussion of any known studies or background research and whether any effects to native habitats or species have ever been observed or could be expected.
3.1, Biological Issues	Loni Adams (CDFW)	A comprehensive baseline biological and water quality assessment is important for a new aquaculture siting. Additionally, historical information on oceanographic, marine life, fishing activities and marine habitat within the preferred and alternative locations should be gathered and presented as part of the assessment.
3.1.1, Cultivation of Non-Native Species	Bryant Chesney (NMFS)	A footnote on page 11 indicates that the VPD may seek approval for Pacific oysters (<i>Crassostrea gigas</i>), rock scallops (<i>Crassadoma gigantean</i>), or marine algae. However, Pacific oysters are not native to California, and appear to have established a self-sustaining population in various embayments in Southern California. The risk of further proliferation of this species is yet to be determined. Ruesink et al. (2005, 2006) provide some perspectives on the ecological implications of introducing non-native oysters. Except for the Mediterranean mussel, risk assessments should be conducted for any non-native species proposed for cultivation. The sentence under Issue A states, "However, the Project area appears to lack suitable substrate for development of natural Mediterranean mussel populations and there are no native shellfish populations in the Project area or in Ventura Harbor." – This sentence is not logically consistent with phrase in subsequent sentence that indicates Mediterranean mussels are pervasive. Likely that Mediterranean mussels do exist in Ventura Harbor. They're common in SoCal harbors and bays. Suggest deleting. "Wildlife Coordination Act" should be changed to "Fish and Wildlife Coordination Act." Information Needs should include risk assessments for any non-native species (except for <i>M. galloprovincialis</i>). Information Needs should include identification of suitable

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
		substrate and any native shellfish populations or sensitive habitats that could be affected.
3.1.2, Water Column Effects	Bryant Chesney (NMFS)	Issue A (Removal of Phytoplankton from the Water Column) Information Needs should include an estimate of the level of localized phytoplankton depletion within farm areas. Issue B (Effects of Equipment on Water Column Habitat) – The structure provided by the cultured species and associated apparatus may provide some degree of structural habitat value. Given that the proposed structures will not be permanent and will be subject to a repeated cycle of planting and harvest, the function provided by the introduced structure may likely be limited to fish attraction, rather than fishery production. However, this is difficult to determine with any certainty based upon available information. If this will be touted as beneficial effect, then more detailed information and monitoring would be necessary to conclude it has a beneficial effect.
3.1.4, Fouling Organisms	Brian Bugsch (State Lands Commission)	As noted in Section 3 of the Strategic Permitting Plan, there is potential for marine aquaculture activities to result in the introduction or spread of nonindigenous invasive species and potential for Project infrastructure to create a substrate for invasive fouling organisms to attach. The Commission's Marine Invasive Species Program is responsible for leading scientific and enforcement efforts to reduce these risks. Please refer to the Program webpage http://www.slc.ca.gov/Programs/MISP.html , and consider coordinating with appropriate Program staff on the best ways to ensure potential impacts are minimized.
3.1.4, Fouling Organisms	Bryant Chesney (NMFS)	A monitoring plan for non-native/invasive fouling organisms should be added to the list of information needs.
3.1.5, Marine Wildlife	Bonnie Rogers (Corps)	Continue to coordinate with NOAA regarding avoidance and minimization of marine mammals entanglement and migration effects. Should data show potential effects to any listed marine mammal species, Section 7 consultation may be required.
3.1.5, Marine Wildlife	Loni Adams (CDFW)	A plan to monitor and study seabird foraging/resting uses of the 2000-acre parcel (monitor baseline and potentially during operations for species identified) should be developed to ensure that state endangered, threatened, fully protected and other sensitive seabird species are not being significantly impacted by buoys, ropes, vessels, lights and other aquaculture gear.
3.1.5, Marine Wildlife	Brian Bugsch (State Lands Commission)	Commission staff recommends the addition of a robust discussion of the potential for Project infrastructure to break loose and create a hazard to both marine wildlife and human activities. While wildlife entanglement is discussed briefly and generally considered a low impact potential itself, the VSE should consider the potential for other materials and marine debris, including derelict fishing gear, to become caught in the aquaculture tension/mooring lines and cause secondary entanglement of marine wildlife. Because derelict gear is already a significant problem in the State's coastal waters, Project facilities must be designed to withstand powerful ocean conditions to the extent feasible and the best management practices developed for the Project must include adequate measures to ensure clear marking of equipment, effective

APPENDIX B (Continued)

Document Location	Name	Comment/Issue
		monitoring, and recovery methods, including for commercial fishing gear that may become entangled in Project infrastructure.
3.1.5, Marine Wildlife	Bryant Chesney (NMFS)	Suggest this section should be broadened to include effects of lost gear/marine debris on wildlife and sensitive habitats or discuss in dedicated marine debris section. Marine debris may adversely affect a variety of living marine resources via habitat degradation, entanglement, ingestion, and transportation of non-native species. Issue B (Potential for Marine Mammal Entanglement in Aquaculture Gear) – Suggest looking at similarities/differences between proposed aquaculture gear and the pot/trap gear that has recently entangled a number of listed whales in northern CA.
3.2, Navigational Issues	Bonnie Rogers (Corps)	For potential effects on navigation, provide information and data regarding current and past boat use and traffic levels by commercial and recreational vessels; and whether or not the project could result in effects to navigation. Describe if any effects to navigation cannot be mitigated.
3.5, Social Impact Issues	Bonnie Rogers (Corps)	Describe all sub-seasurface features in or near the project such as archaeological/cultural resources, structural utility lines, fiber optic lines, or other.
3.5, Social Impact Issues	Brian Bugsch (State Lands Commission)	In order to make a determination regarding Public Trust consistency, Commission staff will need to review detailed information as it is developed, including: information on current Public Trust uses within the proposed plots, the 2,000 acre area, and the areas in and around the individual plots that may be affected; how the proposal impacts those uses, and how those impacts will be mitigated; a detailed diagram for the 100-acre plot design, including the number and type of buoys, spacing, and anchoring system, the minimum and maximum depth of proposed stringlines, and vertical and horizontal spacing. Additionally, please provide information on commercial and recreational activities, such as fishing, and how those activities would be affected by the Project. An environmental justice analysis should be included as part of this discussion, as many fishers and other users dependent on the ocean for their livelihood would be considered socially, ethnically, or economically disadvantaged under the definition of environmental justice.
3.5.1, Commercial Fishing	Bonnie Rogers (Corps)	Address whether or not the area is used by the Coastal Pelagic Species (CPS) fishery and if so, how often/when; and whether or not the project could result in effects to the fishery.

APPENDIX B (Continued)

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