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STAFF REPORT: REGULAR CALENDAR

Application No.:	**9-18-0163**
Applicant:	**Carlsbad Aquafarms, Inc.**
Location:	Agua Hedionda Lagoon, San Diego County.
Project Description:	Request for after-the-fact authorization for five acres of marine shellfish aquaculture operations within Agua Hedionda Lagoon and nearly one acre of adjacent onshore facilities including shellfish nurseries and labs, a depuration system, offices, shellfish packing and processing facilities, restrooms, and equipment storage yards in Carlsbad, San Diego County.
Staff Recommendation:	Approval with conditions.

SUMMARY

Carlsbad Aquafarms, Inc. (CAF) requests after-the-fact approval for the shellfish aquaculture operation it has carried out within Agua Hedionda Lagoon and the adjacent shoreline since 1990. During this time, CAF has retrofit, expanded and repurposed several existing onshore structures as well as constructed and installed new structures for use as a depuration system, office, shellfish nurseries, processing and packing plant, shellfish washing and sorting facility, and personnel restroom, breakroom and storage area. In addition, CAF has established an approximately 1/3 acre area for the storage of shellfish cultivation and nursery equipment and

has anchored and maintained up to 75 longlines within Agua Hedionda Lagoon for the cultivation of Mediterranean mussels and Pacific oysters. The longlines are configured in "rafts" of three lines each and extend approximately 150 feet long and 20 feet wide. Nine of these rafts are used for oyster cultivation using roughly 13,500 hanging plastic trays, and 14 rafts are used for growing mussels on roughly 10,000, 10-foot long, hanging ropes. The longlines are supported with surface floats and are anchored in place with concrete filled barrels placed on the seafloor.

Although CAF has been in operation since at least 1990 (and under its current ownership since 2014), it has been doing so without benefit of a coastal development permit. Through this application, CAF is seeking after-the-fact authorization for its existing facility and operations.

As a result of CAF's failures to obtain the necessary authorizations prior to carrying out development activities, violations of the Coastal Act exist on the subject property. These include, but are not limited to, installation and use of shellfish aquaculture longlines and associated anchoring and floatation systems in Agua Hedionda Lagoon, and construction and operation of offices, a shellfish nursery, marine algae laboratory, depuration systems, and shellfish processing and packing facilities. In response to notification by Commission permitting and enforcement staff about these Coastal Act violations, CAF prepared and submitted this CDP application. Approval of this application pursuant to the staff recommendation, issuance of the permit, and the applicant's subsequent compliance with all terms and conditions of the permit will result in resolution of the above described violations.

The key Coastal Act issues raised by this project are to marine resources - including benthic habitats and marine wildlife. Potential adverse impacts associated with the project include: (a) accidental release of marine debris; (b) disturbance or damage to eelgrass habitat; (c) disturbance or alteration of seafloor habitats due to the deposition of biological or artificial material from the shellfish cultivation facility; (d) spread of non-native marine species; and (e) degradation of water quality due to uncontrolled discharge from onshore shellfish processing operations.

To address these potential impacts and minimize their likelihood and magnitude, **Special Conditions 1 through 12** would require (a) a limited permit term; (b) annual reporting of maintenance inspections and benthic monitoring results; (c) the implementation of a benthic monitoring program to assess and respond to accumulations of aquaculture materials and debris on the seafloor; (d) limitations on the type of non-native oysters grown at the facility; (e) the development and implementation of marine debris management and hazardous material spill prevention and response plans; (f) the development and implementation of a stormwater control plan; and (g) the removal of existing aquaculture equipment from eelgrass habitat and avoidance of such habitat during future operations.

Commission staff therefore recommends that the Commission **APPROVE** coastal development permit application 9-18-0163, as conditioned. The motion for this is on page 4. The standard of review is Chapter 3 of the Coastal Act.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

I move that the Commission approve Coastal Development Permit No. 9-18-0163 subject to conditions set forth in the staff recommendation specified below.

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in approval of the permit, as conditioned, and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of Commissioners present.

Resolution:

The Commission hereby approves Coastal Development Permit No. 9-18-0163 for the proposed project and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment**. The permit is not valid and development shall not commence until a copy of the permit, signed by the applicant or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration**. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation**. Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment**. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land**. These terms and conditions shall be perpetual, and it is the intention of the Commission and applicant to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

1. **Permit Term.** This permit shall expire upon termination of the License Agreement between Carlsbad Aquafarms, Inc. and the owner of the land upon which it operates, Cabrillo Power I, LLC.

2. **Annual Report.** By December 31 of each year, CAF shall submit to the Executive Director an annual report with the results of the seafloor, anchor, and cultivation raft surveys carried out as described in **Special Condition 5**.

3. **Landowner Authorization.** PRIOR TO THE ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, CAF shall remove the existing materials and equipment from within the approximately 0.35 acre area between Carlsbad Blvd. and Agua Hedionda Lagoon (as identified on **Exhibit 3**) or shall submit to the Executive Director evidence that its lease or license agreement with Cabrillo Power I, LLC allows the continued storage of materials and equipment in that area.

4. **Discharge of Materials.** CAF shall not intentionally dispose of or release any equipment or waste, including lines, buoys, cultivation trays, and other equipment, or living or dead shellfish, shells, or non-native fouling organisms into the marine environment. If invasive fouling organisms are present on the cultivation equipment, all maintenance cleaning operations of the cultivation rafts, including its buoys, ropes, lines, cables, and anchors, shall be carried out onshore and in a contained manner sufficient to capture all dislodged biological materials. All non-native fouling organisms and biological materials from non-native organisms removed during these cleaning operations shall be collected and disposed at an appropriate upland facility. No discharge of untreated wash water or non-native fouling materials shall occur during maintenance cleaning operations. All onshore shellfish and equipment cleaning and processing operations shall be carried out in a manner that prevents the discharge of untreated water and biological materials into Agua Hedionda Lagoon.

5. **Benthic Monitoring.** WITHIN 120 DAYS OF PERMIT APPROVAL, CAF shall submit for review and written approval by the Executive Director a Benthic Monitoring Plan that includes, at a minimum, the following:

   Visual benthic surveys of the quantity, type and distribution of materials from the shellfish cultivation facilities in Agua Hedionda Lagoon (such as shellfish, shell material, fouling organisms, and aquaculture equipment) accumulating on the seafloor shall be conducted at multiple sites beneath the shellfish cultivation structures and shall be carried out annually for the first two years and every three years thereafter. Surveys shall be carried out by an independent, third party approved in writing by the Executive Director and shall include randomly selected locations beneath the floating cultivation arrays as well as two control sites to be selected based on their similarity to the project area in terms of sediment character and water depth. The Benthic Monitoring Plan shall describe the proposed survey technique (i.e. survey locations, lengths and widths of transects, location selection methods, etc.), equipment, and protocols to be used for data collection, archiving, and reporting.

If, during monitoring, the visible accumulation of a significant amount of oyster or mussel shell material, fouling organisms, cultivation equipment, or other project-related debris is observed, CAF shall apply for an amendment to this permit proposing to adapt its operations and/or redesign the project to avoid recurrence of these changes, and to mitigate any additional impacts to marine resources that may have occurred. Such project changes shall include the removal of accumulated materials and/or modifications to the management and use of shellfish cultivation rafts. For the purposes of this condition, a "significant amount of oyster shell material, fouling organisms, or other project-related debris" shall comprise any accumulation in excess of a handful of scattered occurrences, such as the formation of piles or layers of debris.

6. **Oyster Cultivation.** All future planting of non-native oysters in Agua Hedionda Lagoon by CAF shall be triploid Pacific oysters (*Crassostrea gigas/Magallana gigas*).

7. **Non-native Oyster Removal.** WITHIN 60 DAYS OF PERMIT APPROVAL, CAF shall submit for Executive Director review and approval a Non-native Oyster Survey and Removal Plan. The Plan shall include a process for finding and removing individuals and populations of non-native oysters growing outside of cultivation in Agua Hedionda Lagoon (for example, on areas of rip-rap, pier supports, or other hard surfaces) on an ongoing basis. Individuals and populations of native Olympia oysters (*Ostrea lurida*) shall be exempt from this condition.

8. **Eelgrass Habitat**. No shellfish cultivation equipment, anchors, or other structures, gear or equipment shall be installed or placed on, in, or over eelgrass habitat, as determined by the Executive Director using the definition of eelgrass habitat in the National Marine Fisheries Service's October 2017 California Eelgrass Mitigation Policy. By May 1, 2019 all existing cultivation structures, gear, moorings, anchors and/or equipment shall be removed from all areas of eelgrass habitat shown on the May 2018 eelgrass survey carried out by Merkel and Associates as part of the 2018 Agua Hedionda Lagoon maintenance dredging project (shown in **Exhibit 4**). Within 30 days of completion, CAF shall provide, for Executive Director review and approval, a report documenting that complete removal has occurred. This report shall be developed by an independent third-party approved by the Executive Director. Any remaining cultivation structures, anchors, moorings or associated equipment, materials or aquaculture debris documented in this report shall be removed by CAF within 30 days of providing the report to the Executive Director. Within 14 days of the completion of this supplemental removal activity, it shall be documented by the same approved independent third-party in a supplemental report submitted to the Executive Director for review and approval.

9. **Spill Prevention and Control Plan.** WITHIN 60 DAYS OF PERMIT APPROVAL, SBM shall submit for Executive Director review and written approval, a project specific Spill Prevention and Response Plan (SPRP) for work vessels that will be used during operational activities. CAF staff shall be trained in, and adhere to, the emergency procedures and spill prevention and response measures specified in the SPRP during all on-water maintenance activities and shellfish planting and harvest operations. The SPRP shall provide for emergency response and spill control procedures to be taken to stop or control the source of

the spill and to contain and clean-up the spill. The SPRP shall include, at a minimum: (a) identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; (b) identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and shoreline resources in the event of a spill. Spill prevention and response equipment shall be kept onboard project vessels at all times; (c) assurances that all hydraulic fluid to be used for installation, maintenance, planting, and harvesting activities shall be vegetable based; (d) assurances that all vessel fueling/refueling activities are carried out with spill prevention and response protocols in place; and (e) emergency response and notification procedures, including a list of contacts to call in the event of a spill.

10. **Marine Debris.** WITHIN 90 DAYS OF PERMIT APPROVAL, CAF shall submit for Executive Director review and approval a Marine Debris Management Plan that includes (a) a plan for permanently marking all floating equipment (buoys, floats, etc.) with the name and contact information of the facility operator; (b) annual maintenance inspections of moorings and mooring lines, cultivation rafts and associated lines to proactively identify areas of wear and breakage and minimize the loss of materials and equipment to the marine environment resulting from breakages and structural failures; (c) a description of the search and cleanup measures that would be implemented if loss of shellfish cultivation facility materials, equipment, and/or infrastructure occurs.

11. **Intake System Design.** All intake systems used by CAF to supply water from Agua Hedionda Lagoon for nursery operations, maintenance, shellfish cleaning, sorting or washing shall be designed with intake screens designed consistent with California Department of Fish and Wildlife and National Marine Fisheries Service guidelines for protection of juvenile fish by having: (a) mesh openings of no more than 3/32 inches; and (b) a maximum throughscreen intake water velocity of 0.5 feet per second.

12. **Stormwater and Run-off Control Plan.** PRIOR TO THE ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the Applicant shall submit, for Executive Director review and written approval, a Stormwater and Run-off Control Plan for existing onshore operations. At a minimum, the plan shall describe all structural and non-structural measures the Permittee will implement to avoid and minimize project-related impacts to coastal waters adjacent to the project site. The Permittee shall implement the Plan as approved by the Executive Director.

    The Plan shall include locations of all project facilities and structures and the measures incorporated around each to avoid and minimize water quality impacts. The Plan shall also identify measures the Permittee will implement to store and/or contain materials and debris originating from the project in a manner that precludes their uncontrolled entry and dispersion into nearby coastal waters. Any debris that inadvertently enters coastal waters shall be removed immediately.

    The Plan will identify Best Management Practices (BMPs) that will be implemented during project activities to protect coastal waters in conformance with the following:

- Appropriate structural and non-structural BMPs shall be designed to treat, infiltrate, or filter the runoff from all surfaces and activities on the project site.
- Structural BMPs (or suites of BMPs) shall be designed to treat, infiltrate or filter the amount of stormwater runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs.
- Runoff from all shellfish cleaning and processing facilities shall be collected and directed through a system of structural BMPs and/or gravel filter strips or other vegetated or media filter devices. The filter elements shall be designed to 1) trap sediment, particulates and other solids and 2) remove or mitigate contaminants through infiltration and/or biological uptake. The drainage system shall also be designed to convey and discharge runoff in excess of this standard from the building site in a non-erosive manner.
- All BMPs shall be operated, monitored, and maintained for the duration of project activities requiring the use of the BMPs. At a minimum, all structural BMPs shall be inspected, cleaned-out, and where necessary, repaired at least twice per month between October 15 and April 15 of each year and at least once per month between April 15 and October 15 of each year.
- The Plan shall identify a worker training program to be implemented that will identify coastal waters and their associated biological resources on and near the project sites, and identify measures to be taken to avoid impacts to these resources.
- The Plan shall include measures for reporting any events where BMPs did not prevent adverse impacts to coastal waters and the measures taken in response to these events.

Prior to implementing any new or modified project developments, facility locations, or BMPs not included in the coastal development permit application materials, the Permittee shall submit for Executive Director review and written approval proposed modifications needed to incorporate these project components into the Plan.

IV. FINDINGS AND DECLARATIONS

A. BACKGROUND AND PROJECT DESCRIPTION

Carlsbad Aquafarm's shellfish aquaculture operation is located on a five acre area within the outer section of Agua Hedionda Lagoon and an approximately one acre area of the lagoon's southwest shoreline. Agua Hedionda Lagoon was created in the 1950s as part of the original development of Diego Gas and Electric Company's Enicina Power Plant (now known as the NRG Cabrillo Power Station). Although a small salt marsh wetland existed in this area historically, the current Agua Hedionda Lagoon system was created as an artificial embayment in order to provide seawater intake and discharge points for the power plant's cooling water.

Aquaculture research and commercial shellfish cultivation has a history in Agua Hedionda Lagoon that goes back several decades. Based on historic aerial photographs, coastal development permit files, historic reports and anecdotal information provided by the applicant, an onshore laboratory was developed along the shoreline of Agua Hedionda Lagoon (in the location currently occupied by Carlsbad Aquafarm's oyster hatchery and nursery building) in the

mid- to late-1970s by a group of researchers associated with San Diego State University. At the time, this land was owned by the operator of the nearby Encina Power Plant, and leased to the aquaculture researchers. Commission staff have been unable to find a CDP for the construction and use of this laboratory. Reports from that time period indicate that the facility was primarily focused on the use of heated water from the power plant's discharge stream to aid in the cultivation of spiny lobster within onshore tanks.

In May of 1981, several years after the research lab began operations, the San Diego Coast Regional Commission approved the issuance of CDP No. F9763 to Aquaculture Systems International for an expansion of the research lab. This expansion would have resulted in the installation of 45 large onshore tanks along a narrow strip of land extending north of the aquaculture lab between Carlsbad Blvd. and Agua Hedionda Lagoon. These tanks were proposed to be used for the commercial cultivation of fish and shellfish. Although the CDP for this project was issued, Commission staff have been unable to find evidence that it was pursued further or constructed.

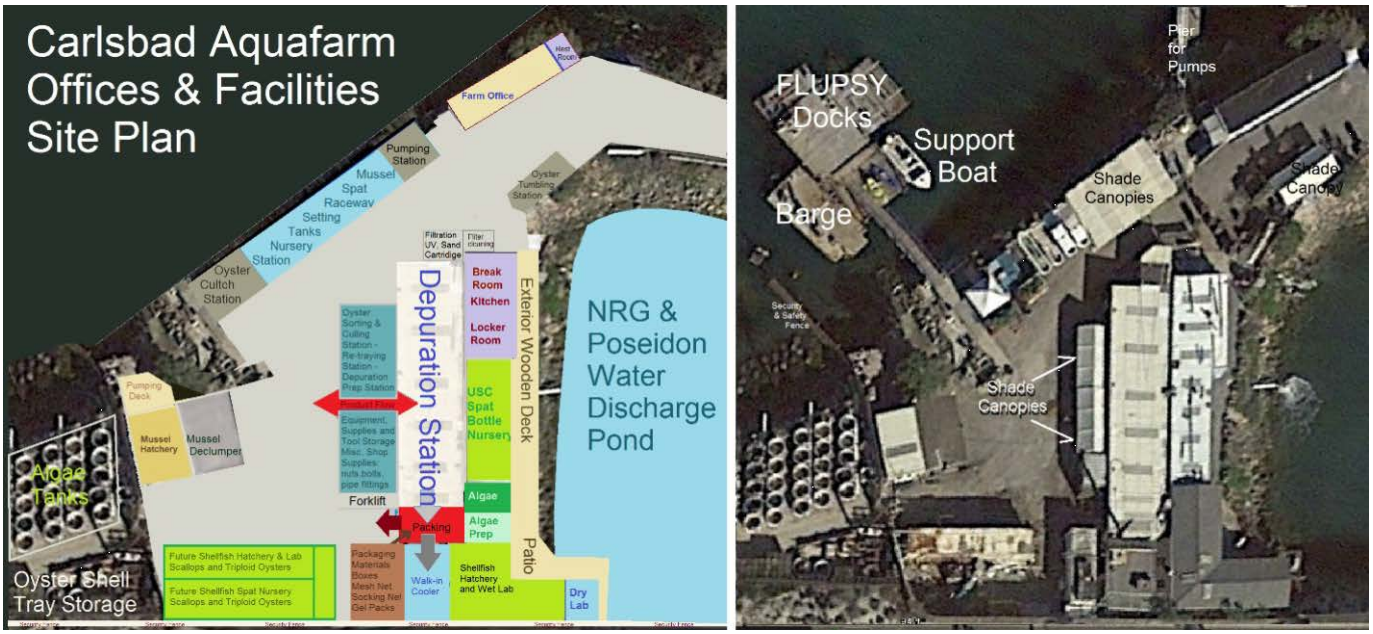
Several years later, in July 1987, the Commission issued an administrative permit (CDP No. 6-87-320) to Seafarms West, Inc. for the construction and operation of a roadside stand for the sale of shellfish grown in Agua Hedionda Lagoon. Although this project also does not seem to have been implemented, based on information in the permit file, Seafarms West, Inc. had an on-going lease from SDG&E to use a portion of the lagoon for shellfish aquaculture and was operating the onshore laboratory facility. This permit provides the first indication in the Commission's files of shellfish aquaculture operations within Agua Hedionda Lagoon. However, Commission staff have been unable to find any additional information about the scope of aquaculture operations within the lagoon and lab at that time, including the species being cultivated, areas of the lagoon being used and the type of cultivation structures being operated.

Anecdotal information provided by the applicant suggests that Seafarms West, Inc. may have been formed by the former San Diego State University research group that originally installed and operated the lab. In 1990, this company was re-organized and became Carlsbad Aquafarms, Inc. (CAF). In 2014, CAF was purchased by Thomas Grimm under the assumption that it was a legally permitted operation. Upon notification by Commission staff that CDP records were not available for CAF's existing onshore buildings and in-water shellfish cultivation structures, CAF developed and submitted a CDP application requesting after-the-fact authorization for the installation and use of these facilities.

Onshore Facilities and Operations

As shown in the figure below, over the past several decades, CAF has developed, installed and constructed an extensive shellfish aquaculture research, operations, and processing facility within an approximately 0.5 acre area leased from Cabrillo Power, LLC along the southwestern shoreline of Agua Hedionda Lagoon. The key elements of this facility include an oyster hatchery and nursery building; a depuration (shellfish decontamination) system; a mussel hatchery building; a mussel "declumping" station; a covered workstation for oyster processing; a packing facility; offices and staff facilities; a seawater pumping and filtration system; and equipment and materials storage. These areas and facilities are described briefly below and detailed in **Appendix B**. Except for a portion of the roughly 0.34 unpaved area used for

equipment storage, these structures and facilities were constructed over a level area paved with concrete and asphalt.



Oyster Hatchery and Nursery Building
Over the course of many years, Carlsbad Aquafarm has refurbished and upgraded the original aquaculture laboratory building operated in the mid-1970s by researchers from San Diego State University. This building now houses CAF's oyster hatchery and nursery facility, including a 110 square foot dry lab that contains equipment for analyzing seawater chemistry and environmental conditions; a 450 square foot oyster hatchery; a 100 square foot microalgae preparation room; a 150 square foot microalgae laboratory; and a 300 square foot staff room.

The oyster nursery and lab facilities in this building are comprised of a series of tanks, filters, water heaters, pumps, and associated plumbing used to spawn, feed, and grow Pacific oyster larvae. The microalgae growing operations provide food for these young oysters. Seawater from Agua Hedionda Lagoon is provided for these operations through an intake and filtration system that includes intakes within the lagoon and a sand and ultra-violet filter located within an adjacent building.

Depuration System
Carlsbad Aquafarm's depuration system is located adjacent to the oyster hatchery and nursery building and is made up of an approximately 1,200 square foot building containing a series of 20 large shallow tanks used to hold harvested shellfish within highly filtered and aerated water from Agua Hedionda Lagoon. This process is used to help ensure that all shellfish produced by CAF meet state and federal health standards. The depuration system requires a constant flow of filtered seawater and results in the intake, filtration, and discharge of approximately 100 million gallons of seawater per year. Seawater is collected through CAF's intake pipes and is discharged directly into the small embayment used for the discharge of cooling water from the power plant.

Mussel Nursery
CAF has also installed a nursery facility for the spawning and seeding of Mediterranean mussels. This facility includes a 12 foot by 20 foot frame structure, plumbed with a washbasin and a series of eight approximately eight foot tall by three foot diameter vertical fiberglass tanks. These tanks are loaded with specialized nylon ropes onto which thousands of larval mussels (called "spat") have adhered and then supplied with seawater infused with microalgae from CAF's microalgae nursery. The mussel spat feeds on the microalgae and grows until they can be detached from the rope and planted within the lagoon on cultivation rafts.

Mussel Processing and "Declumping" Station
Adjacent to the mussel nursery, CAF has installed specialized equipment for processing harvested mussels. This equipment is contained within a covered, open air structure and is used to break apart joined clumps of mussels into individuals. These single mussels are then moved through a series of grates for sorting, cleaning, and grading.

Offices
Directly above the rip-rap shoreline of Agua Hedionda Lagoon, CAF has installed a roughly ten foot by 40 foot office trailer to provide three work spaces and a staff restroom. This office was installed over a previously constructed asphalt and concrete roadbed surface and a small wooden accessway was constructed around its exterior.

Covered Work Area
Adjacent to the building housing the depuration system, a covered concrete slab work area has been constructed to provide approximately 500 square feet for sorting and washing oysters harvested from the lagoon. The work area includes a seawater rinse system supplied with seawater from Agua Hedionda Lagoon through the same intake system that provides water to the other elements of CAF's facility. The concrete slab includes a drain system that removes large particulate matter from the waste water prior to its discharge back into the lagoon.

Seawater Intake and Discharge System
CAF has installed three small diameter PVC intake lines on a short wooden pier that extends approximately ten feet into the lagoon. Before it is used, seawater is pumped into holding tanks where settling reduces turbidity. The water then moves through plumbing designed with a water filtration and treatment system consisting of a combination of sand filters, cartridge filters, and ultraviolet (UV) sterilization. In total, CAF's various labs, nurseries, hatcheries, and shellfish cleaning operations make use of approximately 400,000 gallons of seawater per day. Once used, most of this water is discharged directly into the ocean along with the 500 to 700 million gallons per day of power plant cooling water.

Equipment and Materials Storage
CAF has renovated and installed five shipping containers within its area of operations. These include one forty foot long container, three twenty foot long containers and a ten foot long container used to store equipment, tools, and lab materials. In addition, CAF maintains an approximately 0.34 acre unpaved area located between the lagoon shoreline and Pacific Coast Highway/Carlsbad Blvd. for the storage of oyster shell, tanks, and shellfish cultivation equipment. This area is shown in **Exhibit 3**. Although CAF has held a month-to-month lease

from Cabrillo Power I, LLC since 2006 for a five acre area of Agua Hedionda Lagoon and the area in which its shellfish nursery and processing facilities are located, the area used for equipment storage along Pacific Coast Highway is not included in that lease. CAF has indicated to Commission staff that it is currently pursuing an amendment to its lease in order to continue using this area; however, the issuance of that lease amendment and timeline have not been confirmed. Accordingly, **Special Condition 3** would require CAF, prior to issuance of this CDP, to provide the Executive Director with evidence that its lease has been amended to include this area or to remove the aquaculture equipment and materials currently stored there.

In-water Facilities and Operations

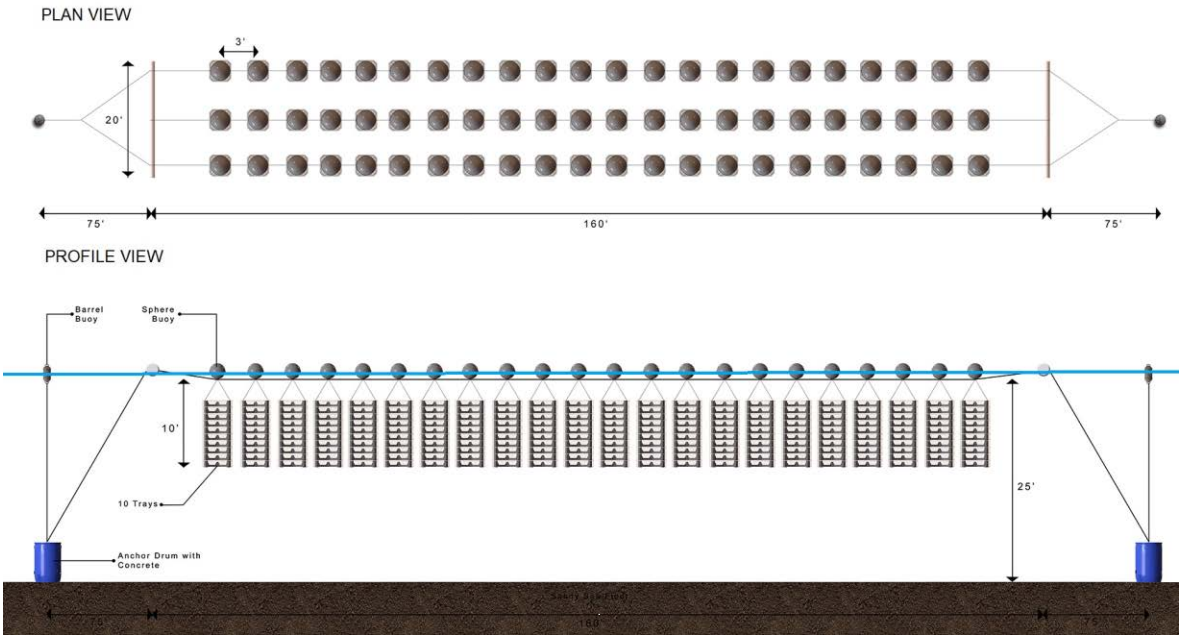
In addition to the onshore buildings and facilities, CAF also maintains and operates shellfish cultivation structures and equipment within a five acre area of Agua Hedionda Lagoon leased from Cabrillo Power I, LLC. The cultivation structures and equipment include three floating upwelling systems (FLUPSYs), nine oyster cultivation "rafts," fourteen mussel cultivation "rafts," three mussel spat collector lines, and a single floating line used to support a series of plastic mesh cultivation baskets stocked with oysters from a USC research project.

FLUPSYs

CAF has installed and operates three custom built FLUPSYs that are used as part of the farm's oyster nursery. The FLUPSYs operate from mid-April through November and are identical in design, with each roughly 20 feet long by 8 feet wide. Each FLUPSY is equipped with eight 24 inch by 30 inch upwelling silos and ¾ horsepower pump used to pull seawater through each of the 24 total FLUPSY silos. These silos are used to quickly grow oyster seed to the size needed for planting or sale offsite to shellfish aquaculture farms. The FLUPSYs are moored to an approximately twenty foot long by five foot wide wooden pier.

Oyster Rafts

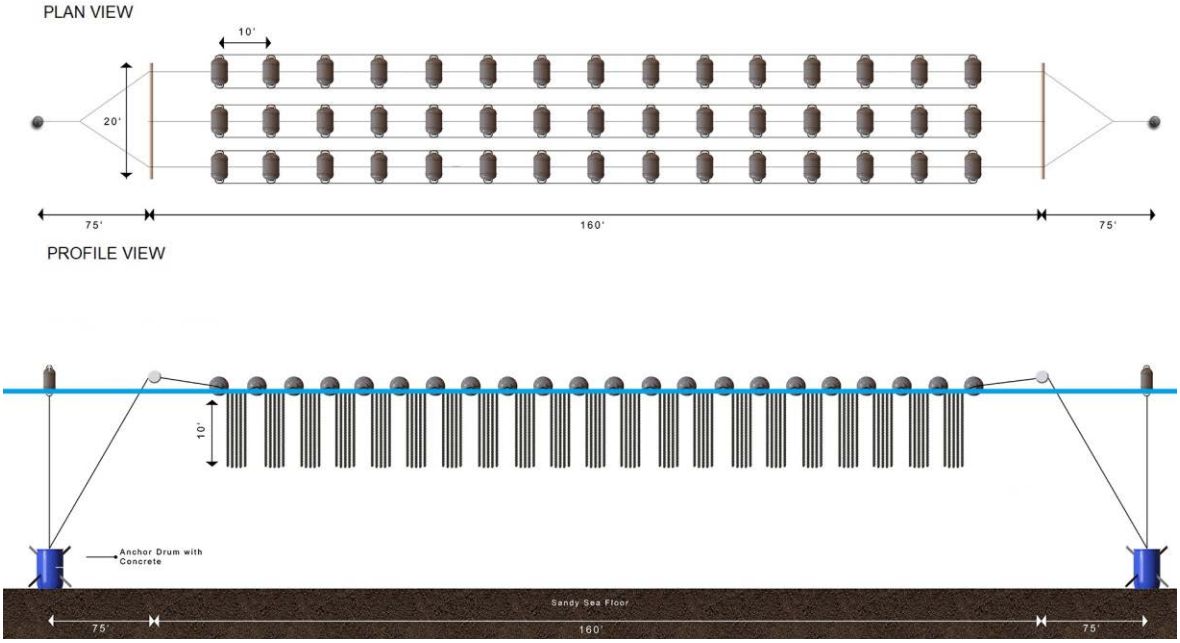
CAF's cultivation of Pacific oysters is carried out through the use of nine 157 foot long oyster rafts located in the central portion of Agua Hedionda Lagoon (as shown on **Exhibit 2**). The figures below provide a design view and photograph of CAF's oyster cultivation rafts. Each raft consists of 150 ball floats rigged in three longlines of 50 ball floats attached in three foot intervals on marine grade rope, terminating at 20 foot long spreader bars at each end. Two 75 foot anchor lines extend from the two terminal ends of the spreader bar to submerged 55-gallon inert, concrete-filled plastic drums, weighing 1,100 pounds. Each anchor is fitted with a pencil float to designate its location. Each ball float supports a stack of ten four square foot plastic mesh trays planted with approximately 100 individual oysters per tray.



Mussel Rafts

CAF has also installed 14 mussel rafts within the lagoon for the cultivation of Mediterranean mussels. Each raft consists of 75 barrel floats rigged in three longlines of 25 barrel floats attached at nine foot intervals on marine grade rope, terminating at a 20 foot wide spreader bar. The bar is affixed to a submerged 55 gallon plastic drum filled with concrete and used as a mooring. In the space between each barrel float on each of the three lines are ten mussel cultivation lines made up of a ten foot length of specialized rope seeded with young mussels.

The figures below show the configuration of a mussel raft and provide a close-up view of a barrel float and submerged mussel lines.



Mussel Spat Collection Lines

Three 300’ mussel spat collector longlines, each consisting of 150 ball floats, in which fuzzy rope is used to procure free swimming juvenile mussel larvae, which set onto the surface of the rope. After the larvae set onto the rope it is stripped from the collector lines and socked onto 10’ cultivation ropes used for growout.

Seed is collected by wild spat recruitment. The farm also purchases seed from Whiskey Creek, based in Tillamook, Oregon. When collecting wild spat, collector lines with fuzzy rope, or similar materials with high surface area, are set out when competent larvae are available mussel growout line. When larvae that settle on the lines reach appropriate juvenile size, they are stripped from the spat collection lines, cleaned and graded, and prepared for socking and attached to the final growout lines and transferred to the grow-out area and grown until they reach market size, whereupon they are harvested and processed as described below.

Hybrid Oyster Research Line
Also included within the approximately five acre area of CAF's in-water operations is a single floating line used to support a series of plastic mesh cultivation baskets that are planted with a hybridized strain of non-native Pacific oysters that a research team from the University of Southern California (USC) are developing. These oysters are being selectively bred to increase survivorship, size and growth rates with the hope of creating a strain of Pacific oysters that will enhance commercial production. The oysters planted on this research line are developed within CAF's onshore oyster hatchery and nursery facility through a partnership with the USC research team.

Operations
To maintain and operate its shellfish cultivation rafts, CAF personnel make use of a 16 foot long skiff and 32 foot long by 16 foot wide barge equipped with a 2-ton capacity crane. The crane is used to lift and retrieve mussel cultivation lines or stacks of oyster trays for cleaning and processing.

Each oyster tray is brought ashore every five to six weeks so the oysters can be sorted, cleaned and processed. During this processing, oysters that have grown to market size are collected, those not ready for harvest are replanted within the lagoon along with new oysters from the FLUPSYs that have grown to sufficient size for out-planting.

The mussel rafts are also frequently inspected. Harvest typically occurs after a three to five month grow-out period, and planting and maintenance inspections occur more regularly during that time. Between these activities, CAF staff are typically operating within the lagoon on a daily basis.

B. OTHER AGENCY APPROVALS AND CONSULTATIONS

California Fish and Game Commission
The California Fish and Game Commission (FGC) has a wide range of responsibilities, including authority for leasing state tidelands for shellfish cultivation. However, because the submerged portion of Agua Hedionda Lagoon used for shellfish cultivation by CAF is privately owned and is not on state lands, it is not managed by the FGC through a state aquaculture lease.

California Department of Fish and Wildlife
In addition to providing staff support for FGC, the California Department of Fish and Wildlife (CDFW) is also responsible for ensuring that those cultivating shellfish within the state's marine waters have a valid aquaculture registration and adhere to the CDFW's biosecurity regulations to prevent the release or spread of parasites, diseases or invasive species associated with shellfish

cultivation. Carlsbad Aquafarms (CAF) currently has a valid aquaculture registration with CDFW.

U.S. Army Corps of Engineers
The U.S. Army Corps of Engineers (ACOE) has regulatory authority under Section 404 of the Clean Water Act of 1972 and Section 10 of the Rivers and Harbors Act of 1899 (*33 U.S.C. 1344*). CAF has been operating without a permit or other authorization from ACOE and has been in discussions with ACOE staff about whether such authorization is required. Commission staff have coordinated with ACOE throughout its review of this project.

If ACOE determines that a permit is required, pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), ACOE cannot issue an individual permit to CAF until the Commission either concurs or is conclusively presumed to concur in a federal consistency certification. Commission approval of this CDP application would constitute concurrence under the CZMA for any ACOE permit that allows development activities also covered by this CDP.

Regional Water Quality Control Board
Projects involving discharges of dredged or fill material to waters of the United States that require ACOE permits under Clean Water Act Section 404 are also required to obtain authorization from the Regional Water Quality Control Board under Clean Water Act Section 401. Depending on the results of its discussions with ACOE, Carlsbad Aquafarms may reach out to the San Diego Regional Water Quality Control Board about the process of developing and submitting an application for a 401 certification.

C. PLACEMENT OF FILL IN MARINE WATERS

Section 30233(a) of the Coastal Act states in part:

> *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
>
> *(2) Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
>
> *(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
>
> *(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
>
> *(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*

(6) Restoration purposes.
(7) Nature study, aquaculture, or similar resource dependent activities.

The placement of approximately 50 concrete filled 55-gallon drums within submerged areas of Agua Hedionda Lagoon as anchors for the 23 shellfish cultivation rafts operated by CAF constitutes the placement of fill in open coastal waters. Coastal Act Section 30233(a) restricts the Coastal Commission from authorizing a project that includes fill of open coastal waters unless it meets three tests. The first test requires that the proposed activity must fit into one of seven categories of uses enumerated in Coastal Act Section 30233(a). The second test requires that there be no feasible less environmentally damaging alternative. The third test mandates that feasible mitigation measures be provided to minimize the project's adverse environmental effects.

Allowable Use Test
One of the seven allowable uses of fill is aquaculture (Section 30233(a)(7)). Because the concrete drum anchoring devices would support shellfish aquaculture equipment, the Commission finds that the proposed project meets the allowable use test of Coastal Act Section 30233(a).

Alternatives
The Commission must further find that there is no feasible less environmentally damaging alternative to the proposed placement of fill in open coastal waters. No known project alternatives would meet the objective of the proposed project – to install and operate a marine shellfish aquaculture facility – without the placement of at least some fill material in open coastal waters.

Commission staff therefore evaluated several alternative anchoring systems that would require differing amounts of fill. These anchoring systems included weighted concrete moorings, metal fluke or Danforth anchors, and helical screw anchors. These three systems represent a range of seafloor footprint areas – with concrete moorings taking up the most area (between three and five square feet each), helical screw anchors taking up the least (several square inches) and fluke anchors falling in between (two- or three-square feet once embedded).

However, installation of the helical screw anchor system can be significantly more expensive than other systems. It would involve the use of a specialized hydraulic-powered underwater drill machine, as well as a specially-equipped construction vessel to lower the drill to the seafloor and retrieve it. While screw anchors would result in less fill than concrete moorings or fluke anchors, because they cannot be easily recovered or relocated once installed, they are most appropriately suited for equipment that can be fixed in place long-term or permanently. Due to the periodic maintenance dredging (which has occurred seven times since 2000) of the portion of Agua Hedionda Lagoon in which CAF's cultivation rafts are located, it is important for CAF to be able to easily retrieve and relocate the anchoring devices for its cultivation rafts. As such, helical screw anchors would not be a feasible anchoring system for the project location.

Although concrete moorings would likely displace a slightly larger area of seafloor compared to fluke anchors, because concrete moorings rely solely on mass and are not embedded into the seafloor, they can be placed and retrieved with less disturbance to benthic habitat. Due to the

need for CAF to periodically relocate and reposition its cultivation structures so as to not interfere with dredging operations, fluke anchors would not provide a less environmentally damaging alternative to the proposed continued use of concrete moorings.

Therefore, the Commission finds that the second test of Coastal Act Section 30233(a) has been met.

Mitigation

The final requirement of Coastal Act Section 30233(a) is that filling of coastal waters can only be permitted if feasible mitigation measures have been provided to minimize any adverse environmental effects associated with that fill. If the anchors are installed outside of sensitive marine areas such as sites with rocky reef or eelgrass habitat, their small benthic footprint and the ability of many soft substrate benthic organisms to quickly recover from small disturbance events (such as anchor installation) would limit the significance of adverse environmental effects associated with their installation. If the installation sites are in soft substrate habitat that is locally or regionally abundant, the significance of the adverse environmental effects would be further reduced. In order to help ensure that CAF only installs and maintains its shellfish cultivation rafts and associated moorings outside of sensitive marine habitat areas, **Special Condition 8** prohibits CAF from placing moorings or aquaculture equipment, on, over, or in eelgrass habitat and requires CAF to remove and relocate any such equipment or moorings that are currently located within eelgrass habitat. Because eelgrass habitat in the outer section of Agua Hedionda Lagoon is located around the periphery of the lagoon, **Special Condition 8** would effectively ensure that CAF's shellfish cultivation rafts and associated moorings remain within the central portion of the lagoon. In addition to being dominated by more common and less sensitive soft substrate marine habitats (such as sands and fine silts), this area experiences consistently high levels of sedimentation as well as maintenance dredging activities every two to three years and is therefore already subjected to regular habitat disturbance. The placement and maintenance of up to 50 three to five square foot moorings within this area would not therefore result in significant adverse environmental effects.

However, as discussed further in the following sections of this report, other aspects of the project – including equipment operation and installation activities associated with anchor placement – do have the potential to result in adverse environmental effects. Accordingly, the Commission has identified feasible mitigation measures that will minimize those adverse environmental effects associated with the placement of fill. For example, the section below on Oil Spills includes a discussion of adverse impacts associated with the potential release of hazardous materials from hydraulically powered equipment such as that proposed to be used to install the anchoring systems and harvest the cultivated shellfish and describes measures to minimize that risk. These include the requirement in **Special Condition 9** that CAF develop and submit for review and approval a Spill Prevention and Response Plan that ensures that adequate spill prevention measures are taken and response capability is provided during activities that may result in a spill. In addition, **Special Condition 10** would require the development and implementation of a Marine Debris Management Plan which includes annual maintenance inspections of the anchors and associated attachment lines, and require that any maintenance issues identified during annual surveys, including broken, worn, or especially fatigued materials, are remedied immediately. These requirements would help ensure that the anchors remain functional - thereby minimize the potential release of marine debris from a structural collapse or degradation of the cultivation rafts

– and that any fishing equipment or other debris that accumulates on the facility is properly removed and disposed of on land. These measures would further minimize the facility's potential to entangle or injure marine wildlife.

The Commission finds that with the addition of **Special Conditions 8, 9 and 10**, feasible mitigation measures have been provided to minimize any adverse effects of fill, and, therefore, that the third and final test of Coastal Act Section 30233(a) has been met.

D. MARINE RESOURCES AND WATER QUALITY

Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Placement and operation of the CAF's shellfish cultivation facilities within Agua Hedionda Lagoon have the potential to affect marine species, habitats, and biological productivity through disturbance, loss, and alteration of benthic habitat; deposition of organic materials; release of marine debris; attraction and growth of invasive fouling organisms; and release of reproductive materials from non-native species.

Non-Native Species

The proposed project has the potential to adversely affect native species, habitats and marine biological productivity through the introduction and spread of non-native marine species. These effects may come from two primary sources – (1) planting and cultivation of non-native Pacific oysters and Mediterranean mussels and (2) attraction and spread of non-native fouling organisms on the facility's submerged infrastructure and equipment.

Pacific oysters

At maximum capacity, CAF would grow a crop of approximately 150,000 adult Pacific oysters (roughly 100 oysters per cultivation tray x 1,500 cultivation trays). These oysters would be grown in submerged plastic mesh cultivation trays held in place by large floats and attached to

nylon rope longlines that are anchored in the lagoon. The oysters would be grown from "seed" – tiny immature oysters attached to small fragments of ground shell – and after 12 to 24 months would be harvested as mature reproductively viable adults. Pacific oysters are native to East Asia and have been translocated around the world for aquaculture. The species is included on the California Department of Fish and Wildlife (CDFW) and California Fish and Game Commission "List of Approved Plants and Animals That May be Propagated by Registered Aquaculturists" in the state.

As discussed extensively in the Commission's Adopted Findings for CDP No. 9-14-0489 (USC-Wrigley, Oyster Research), in addition to being one of California and the world's most popular shellfish species for aquaculture, the Pacific oyster is known to escape cultivation and develop wild populations outside of its native region that can significantly alter marine habitats and communities of native species. Contributing to its ability to escape cultivation are the Pacific oyster's abilities to change gender to optimize reproductive potential and to reproduce through "broadcast spawning" events in which each female oyster can release 50-200 million eggs into the water column where they trigger surrounding oysters to release their own reproductive material. Once fertilized, oyster eggs then drift on the currents for up to several weeks as they develop into free swimming larvae and then settle out on suitable hard surfaces.

Although incidents of Pacific oysters becoming established within new ecosystems have most extensively been documented outside of California - for example, the Pacific oyster has established permanent and self-sustaining wild populations on five continents (e.g., Ruesink et al. 2005; Carrasco and Barón 2010) – naturalized populations of Pacific oysters also now appear to be present at a number of locations within the state, particularly in southern California. Research and biological survey work carried out in recent years has shown that Pacific oysters can be found in the wild at several locations from Los Angeles Harbor south to the Tijuana River Estuary, including Agua Hedionda Lagoon (Grosholz et al. 2012, 2015; Crooks et al. 2015; Merkel and Associates 2015). Other research indicates that prior to the past several years, this conspicuous species of shellfish had never before been recorded in such abundance in these locations (Carlton 1979, Cohen 2008, Crooks et al. 2015, Zacherl 2015, Novoa et al. 2016). As noted by Crooks et al. (2015), this is remarkable, in part, because there have been a number of historical attempts to intentionally introduce Pacific oysters to the region that have failed:

> *Even with this widespread import, persistent populations of Pacific oysters were not reported in California throughout the 19th and 20th centuries, although many oyster associates did successfully invade (Carlton 1979, Grosholz et al. 2012). Occasional instances of wild Pacific oysters were reported, including one specimen found in Mission Bay, San Diego (as Ostrea laperousi, noted as "introduced - large 4 to 5 inch specimen" [Wilson 1943]) and a small number in Newport Bay in the 1940s (Carlton 1979). Starting in the year 2000, new incidences of Pacific oysters in southern California began to be reported. Cohen et al. (2005) found Pacific oysters in Los Angeles Harbor in 2000, and LaGrange (2002) reported them from San Diego Bay soon thereafter. This was coupled with other reliable sightings from San Diego Bay and Mission Bay in the early 2000s (C. Gramlich, San Diego State University, personal communication, 2006).*

> *In 2005, we noted the presence of Pacific oysters within Mission Bay, the Tijuana River Estuary, and Oceanside Harbor (Figure 1). Since that time, we have found non-native Pacific oysters in virtually every suitable system in San Diego County, including Oceanside Harbor; Agua Hedionda, Batiquitos, San Elijo, San Dieguito, and Los Peñasquitos lagoons; Mission Bay; the San Diego River flood control channel; San Diego Bay; and the Tijuana River Estuary (Figure 1, Figure 2). Individuals range in size from recruits to specimens reaching 300 mm in length, with instances of multiple year classes present at a given time.*

This emerging trend has triggered discussions among the scientific and natural resource management communities about possible sources and contributing factors. Several of these factors are discussed by Cohen (2006) in his memo describing a similar recent appearance of Pacific oysters in San Francisco Bay and the resulting efforts to survey and remove them:

> *Although C. gigas has been grown commercially in central California since 1928, with many millions of oysters reared through maturity and apparently releasing spawn into the environment, there are records over that period of only a few dozen oysters settling as a result (Carlton 1979). However, we have now collected over 260 C. gigas (estimated to be a fraction of the population in the* [San Francisco] *Bay), indicating a rate of settlement that is orders of magnitude greater than observed in the region over the previous 78 years, and in a bay where the oyster has not been grown commercially in recent years. The reason for the enhanced settlement is not known. The oysters might be a genetically distinct strain from previously cultured C. gigas; or environmental conditions may have changed in a way that makes it easier for the oysters to settle (for example, higher phytoplankton concentrations have been reported in the South Bay in recent years— Cloern et al. 2006). In recent years there have also been reports or records of a few populations of settled C. gigas in other parts of California (southern California and Humboldt Bay), where settlement was previously unknown or extremely rare, so it's possible that the recent settlement in San Francisco Bay is part of a broader phenomenon.*

While the reasons continue to remain unknown for this recent trend of Pacific oysters establishing in California in numbers and locations not previously documented, if it is a lasting change due to a persistent shift in ocean or environmental conditions, it may have significant and lasting consequences. This is largely because the current pattern of Pacific oysters appearing in small numbers and low densities within southern California may shift to a pattern of increasing abundance and more widespread distribution – particularly because of the apparent abundance of suitable habitat. This possibility is described by the California Department of Fish and Wildlife in its California Non-native Estuarine and Marine Organisms (Cal-NEMO)[1] database, as it summarizes a typical pattern of spread of Pacific oyster into new locations:

> *In introduced locations, C. gigas often starts by being confined to culture areas, with only sporadic and limited reproduction, but later becomes a major biomass component and ecosystem engineer. This process, which has taken 3-10 decades, has occurred in British Columbia, Washington, the North Sea, the Atlantic coast of Patagonia, Hawaii, and*

[1] Fofonoff, P.W., Ruiz, G.M., Steves, B, and Carlton, J.T. (2003). California Non-native Estuarine and Marine Organisms (Cal-NEMO) System. Available at: http://invasions.si.edu/nemesis/. Accessed on June 18, 2018.

> *Australia. In some cases, C. gigas poses risks to native oyster populations, including competition, hybridization, and introductions of associated organisms (e.g. parasites, fouling species and oyster predators).*

As it is unknown what is driving the trend of increasing Pacific oyster establishment seen in recent years, it is also unknown what may trigger the sharp increase in abundance that has been observed in other locations around the world with this species and when that event may be triggered. Based on available research and biological survey reports[2], however, the recently observed trend in southern California appears to be continuing and may be increasing. As such, intentional and continuous introduction and cultivation of Pacific oysters within southern California should be closely examined.

In southern California, adult Pacific oysters are currently being intentionally cultivated in only four locations – as part of the Santa Barbara Mariculture project reviewed and approved by the Commission in 2018 (CDP No. E-12-012-A1), at the Carlsbad Aquafarm shellfish aquaculture facility in Agua Hedionda Lagoon, as part of the KZO Seafarms operation in federal waters off of Long Beach (authorized by the Commission in 2014 through Consistency Certification No. CC-035-12), and as part of a small-scale, four-year research effort on oyster reproduction by the USC Wrigley Institute for Environmental Studies in Catalina Harbor (authorized by the Commission in 2015 through CDP No. 9-14-0489).

In approving the USC Wrigley Institute project several years ago, the Commission required USC to carry out annual monitoring efforts throughout the harbor to find and remove Pacific oysters and to ensure that new settlement and expansion of wild Pacific oyster populations does not occur. If the annual monitoring does document new oyster settlement, USC is required to apply for a CDP amendment within 30 days to address the issue or to suspend cultivation of mature Pacific oysters.

This approach was developed because the success of the USC research project relied on cultivation of reproductively viable Pacific oysters and because the small numbers of oysters it was proposing to cultivate and environmental conditions in Catalina Harbor were found unlikely to support successful spawning and settlement.

In contrast to this research effort, commercial oyster cultivation does not require reproductively viable oysters. In fact, many years of research has gone into developing oysters that are largely sterile in order to meet the needs of the oyster aquaculture industry. These are known as triploid oysters and they are bred to have faster growth rates, higher meat quality, and to allow year-round harvesting.

In concurring with the consistency certification for the KZO Seafarms project in 2014 (CC-035-12) and approving the CDP amendment for Santa Barbara Mariculture in 2018, the Commission memorialized both applicants' commitments to cultivate only triploid Pacific oysters in order to

[2] Including observations by Commission staff in Alamitos Bay and Mission Bay as well as those described in Crooks et al. 2015, Merkel and Associates 2015, Anderson 2016, and California Academy of Sciences 2018.

minimize the project's potential contribution to the establishment of this species in southern California.

Although several studies have shown that not all triploid oysters are completely sterile, even under the carefully controlled and optimized laboratory settings used in these studies, only 2% to 13% of triploid oysters have been capable of spawning (Guo and Allen 1994, Gong et al 2004). In addition, even when these triploid oysters do successfully spawn and generate fertilized offspring, survivorship of that offspring is severely impaired – even under laboratory conditions it has been shown to be significantly less than 1% of the survivorship typical of normal, non-triploid oysters (Guo and Allen 1994). In the natural environment where predators are present and environmental conditions can change rapidly, both spawning potential and survivorship of offspring are expected to be even lower. This means that in most natural conditions, triploid oysters would be functionally sterile and not capable of escaping cultivation or creating self-sustaining populations.

Because the shellfish cultivation operation in Agua Hedionda Lagoon that CAF is proposing to continue (and is requesting after-the-fact authorization for) includes a significant amount of oyster cultivation efforts, and current research has demonstrated that Pacific oysters are capable of escaping cultivation and establishing self-sustaining wild populations within that lagoon, the Commission is requiring in **Special Condition 6** that all future Pacific oyster cultivation carried out by CAF be limited to triploid oysters[3]. Cultivation of these types of oysters with a very limited ability to successfully reproduce and spread would minimize CAF's contribution to the further establishment and spread of Pacific oysters in Agua Hedionda lagoon and elsewhere in southern California. As noted above, this approach is consistent with that taken by the Commission in its authorization of the Santa Barbara Mariculture and KZO Seafarms projects, the only other commercial shellfish aquaculture operations in southern California.

To address any remnants of those limited populations of Pacific oysters that have been observed in Agua Hedionda Lagoon in recent years and may still be present, **Special Condition 7** would require CAF to develop and submit for Executive Director review and approval a non-native oyster survey and removal plan. This approach is similar to that required by the Commission in its review of the USC Wrigley Institute Pacific oyster research project on Catalina Island and would help ensure that those Pacific oysters that may have escaped from CAF's aquaculture operations are removed from the wild.

Neither of these conditions would apply to populations of native Olympia oysters (*Ostrea lurida*) that may be growing naturally in the lagoon or cultivated in the future by CAF. There is growing interest in the recovery and repopulation of this native species in California, and a number of projects in San Francisco Bay and Orange and San Diego Counties – including several that have proceeded with substantial support from CAF – are attempting to promote its return to areas of historic abundance. One of the significant challenges facing some of these efforts has been competition with non-native Pacific oysters that can also colonize the reef materials and structures used to promote the recovery of Olympia oysters. With the elimination of

[3] **Special Condition 6** would allow CAF to grow and harvest those non-triploid Pacific oysters currently planted within its oyster cultivation rafts but would require all future planting of Pacific oysters to be limited to triploids.

reproductively viable Pacific oysters from Agua Hedionda Lagoon provided through **Special Conditions 6 and 7**, a potential source of this species' presence in the region would be addressed and ongoing and future native oyster restoration efforts may benefit.

Mediterranean mussels
In addition to the proposed cultivation of Olympia and Pacific oysters, CAF also proposes to continue growing Mediterranean mussels (*Mytilus galloprovincialis*). Similar to the Pacific oyster, this is another species that is not native to California that has been brought here and many other places throughout the world for aquaculture. In contrast to the Pacific oyster, however, in California, the Mediterranean mussel has already become well established and extremely abundant in the wild. Surveys by Suchanek et al. (1997) demonstrate that it is now among the most abundant mussel species between Marin County and San Diego, and research by Geller (1999) suggests that since the 1900s, the Mediterranean mussel may have completely replaced and/or hybridized with the native blue mussel (*Mytilus trossulus*) between Monterey Bay and San Diego.

Given the existing abundance of this species throughout both the project area and the wider southern California region, the existing and proposed cultivation efforts by CAF would have an insignificant contribution to the continued presence of the species in the area. The location of CAF's aquaculture facility in waters a short distance from extensive wild populations of Mediterranean mussels does not introduce a source of reproductive material to current systems and larval transport pathways that are not currently available to the species. As the settlement and growth of Mediterranean mussels on CAF's mussel seed collector lines demonstrates, the water column at the project site already contains Mediterranean mussel larvae from wild populations and the proposed project is therefore unlikely to result in the release of reproductive material for this species in an area in which none currently exists.

Fouling organisms
Shellfish farms and other artificial structures in marine environments provide a three dimensional habitat for colonization by fouling organisms and associated biota (McKindsey et al. 2006; Costa- Pierce and Bridger 2002). Compared to rocky or soft-substrate benthic habitats, these structures can provide a much larger surface area available for the attachment of biofouling organisms (Keeley et al. 2009). A variety of studies indicate that the dominant organisms on submerged artificial structures includes algae and attached filter-feeding invertebrates such as sea squirts, bryozoans and mussels (Hughes et al. 2005; Braithwaite et al. 2007). These assemblages typically have a range of other non-sessile animals associated with them, such as polychaete worms and various small crustaceans. Based on overseas research, the assemblages that develop on artificial structures can be quite different from those in adjacent rocky areas (Glasby 1999; Connell 2000).

Based on surveys carried out on submerged structures within Agua Hedionda Lagoon and nearby areas, a wide variety of invasive marine species are present at these sites, including numerous species known to present significant economic and ecological risk to marine areas along the west coast. Many of these species are known to be "fouling organisms," species of invertebrates and algae that are known to seek out and colonize artificial hard substrate in the marine environment. Maintenance activities for in-water structures and vessels that involve periodic removal of

fouling organisms without proper collection and disposal protocols may result in increased dispersal and propagation opportunities for these species. Such opportunities for dispersion and spread pose a particular risk with some algal species and colonial tunicate species such as didemnum that may break apart into many pieces when disturbed, each of which may be capable of surviving, growing, and reproducing on its own.

As noted in the Mitigated Negative Declaration (MND) prepared recently for the Santa Barbara Mariculture project by the California Fish and Game Commission:

> *Certain invasive tunicates are of great concern in their potential to rapidly colonize and overwhelm surfaces and benthic organisms that include cultured shellfish, shellfish culture gear, and other natural and artificial hard-substrate habitat and the native colonizers of such habitat. The club tunicate (Styella clava), the transparent tunicate (Ciona savignyi), sea vase (Ciona intestinalis), and the colonial tunicate (Didemnum vexillum) represent some of the most important invasive tunicates of potential concern that could colonize the Proposed Project area.*
>
> *None of these species are currently known to be found in waters near the project site (Curran et al., 2013). Surveys of Didemnum species distribution throughout the US and South Canadian Pacific coast have furthermore not shown it to be present in the Santa Barbara Channel (Bullard et al., 2007) and that is confirmed by a lack of on-farm sitings by the operator (Bernard Friedman, pers. comm.). However, due to the smothering impacts that such invasive tunicates can have on both natural habitats and mariculture production, diligence is called for in both identifying and rapidly reporting new appearances, and the practical and effective removal of such organisms should they occur. Of note is the farm's practice of frequent inspections and maintenance, which may serve as a sentinel site for CDFW coordination of the rapid response to novel sightings in the area of invasive species of concern.*

To address this issue, both that MND and Santa Barbara Mariculture's aquaculture lease include mitigation measures calling for regular cleaning and inspection of submerged gear and the onshore disposal of invasive fouling organisms in order to limit their potential to spread.

Special Condition 4 would echo this approach by prohibiting the intentional release of non-native fouling organisms into the marine environment and by helping ensure that maintenance cleaning operations are carried out in a manner that limits uncontrolled discharges. This would reduce the possibility that the proposed project would contribute to the further spread of invasive species in the vicinity of the project.

Benthic Habitat and Eelgrass

The approximately five acre area within the central part of Agua Hedionda Lagoon in which CAF's 23 shellfish cultivation rafts and research line are located was originally dredged in 1954 as part of the construction of the Encina Power Station and has been subject to routine maintenance dredging since that time. The Commission has approved dredging at this location a large number of times since 1977. The most recent approvals were in January 2002, August 2004, November 2006, November 2008, August 2010, October 2014, and December 2017. This

dredging is carried out to remove sediment transported into the lagoon by tidal action through the existing jetty structure and to allow for the maintenance of the tidal prism required to provide the Encina Power Station with an adequate volume of seawater for cooling purposes. The sand collected during these maintenance dredging events is transported to local recreational beaches and used for nourishment.

As a result of these dredging events – and the constant deposition of sediment within the lagoon that make them necessary – the soft sandy benthic habitat within the central portion of Agua Hedionda Lagoon is subjected to frequent and extensive disturbance. The invertebrate species which occupy this habitat are those that can recolonize after these disturbance events and are likely abundant in surroundings areas of similar habitat within Agua Hedionda Lagoon and the nearby outer coast. The presence and periodic relocation of moorings for CAF's oyster and mussel cultivation rafts – which occupy less than 300 total square feet – would result in an insignificant level of additional disturbance or displacement of soft substrate habitat in this area.

Eelgrass

However, the outer basin of Agua Hedionda Lagoon also contains extensive eelgrass beds, a protected resource under Coastal Act policies. Eelgrass provides habitat for many fish and invertebrates and previous Commission approvals (including the recent CDP for the 2017/2018 maintenance dredging event, CDP No. 6-17-0732) have required mapping of the existing eelgrass beds prior to dredging and after dredging to determine any adverse impacts from dredging and required mitigation for any loss of eelgrass. While CAF has recently relocated its three mussel collection lines and one of its shellfish cultivation rafts from the areas of eelgrass along the periphery of the lagoon and does not propose to use these areas for any future aquaculture activities, it is not clear if the moorings for the lines and raft were also removed. **Special Condition 8** memorializes CAF's commitment to not use eelgrass habitat areas – as recently mapped in May 2018 as part of the post-dredge eelgrass survey – and also requires CAF to remove, by May 1, 2019 (near the beginning of the eelgrass growing season in southern California), any moorings or equipment that may still be present within these areas.

Accumulation of Biological Materials

Extensive research has shown that over time, the seafloor below shellfish aquaculture facilities can accumulate large amounts of biological material that becomes dislodged or discharged from the facility above and sink through the water column. Such material typically includes feces and pseudofeces[4] from the cultivated shellfish (collectively known as biodeposits); fouling organisms such as algae, barnacles, sponges, and other species of shellfish that settle on the artificial hard substrate of the facility and become dislodged due to natural processes or operational activities; and cultivated shellfish or shells that also become dislodged from the cultivation structure during growth, storm events, predation from marine wildlife, cleaning, and harvest activities. The accumulation of this material on the substrate below mussel aquaculture facilities is the most commonly discussed environmental impact in the international scientific literature. Research on

[4] Filter feeding shellfish including mussels feed by pumping water through specially adapted gills that act as filters to trap particulate matter. Trapped particles are then wrapped in mucus and either ingested as food or ejected as pseudofeces. Typically many times larger than the particulate matter naturally found in the water column, this pseudofeces sinks to the bottom more readily.

mussel aquaculture farms in Maine, Sweden, Scotland, and New Zealand, several of the areas with large existing mussel aquaculture industries, suggest that up to four inches per year of biodeposits and shell material can accumulate in areas below active mussel farms (Mattsson and Linden 1983, Wilding and Nickell 2013). Overall, the total amount of organic enrichment of the substrate below an active aquaculture facility can be substantial and can lead to a variety of direct and indirect effects.

As shown by Wilding and Nickell (2013), Wilding (2012), and a wide variety of prior research, direct effects of organic enrichment include alteration of the physical structure and composition of seafloor sediment, alteration of the chemical makeup of sediments, and changes to the community structure of benthic organisms.

While the accumulation and subsequent decomposition of organic materials affects physical sediment characteristics such as grain size and composition, the largest impact on the physical structure of the seafloor sediment expected to occur beneath the shellfish cultivation facility would be from the deposition of intact and broken shells (Tenore et al. 1982; Kaspar et al. 1985; Stenton-Dozey et al. 2005). As these shells are fed upon and deteriorate further they are broken into a matrix of calcium carbonate fragments known as shell hash. Studies of mussel farms have consistently shown that high levels of shell hash can accumulate in soft sediments; the estimates of Mattsson and Linden (1983) that between 2,000 and 4,000 shells per square meter can be deposited per year below an active mussel farm have often been corroborated (recently, in Wilding and Nickell 2013). As the proportion of shell hash in the substrate increases, it may influence the type and abundance of invertebrate species that live on and in it, thus altering the structure and productivity of the ecological community in the affected area.

Changes to sediment chemistry that have been observed to result from the organic enrichment of sediments with biological material from overlying mussel farms typically consists of an increase in sediment oxygen demand (as this biological material decomposes) and an upward shift in the zone in which sulfides are formed (Pearson and Rosenberg 1978). Because many species typically found in soft substrates are not particularly tolerant of sulfides, this chemical shift often results in the loss of larger, more complex sediment dwelling organisms, and a shift towards a lower diversity assemblage of sulfide specialist species (Weston 1990; Tenore et al. 1982).

At the most basic level, the deposition of organic material beneath a shellfish farm causes an influx of predatory and scavenging species that are able to exploit the organic material as a source of consistent food. Species such as polychaete worms and starfish have frequently been observed in particularly high density in these environments within a fairly short period ranging from weeks to months. As demonstrated in Wilding and Nickell (2013), the density of starfish below mussel farms off the Scottish coast was two to 27 times higher than at a distance of several hundred feet away. Fundamental ecological models of seafloor sediments subjected to organic enrichment indicate that as organic materials increase, trophic community structure shifts (Weston 1990), the abundance of organisms increases and the biomass and number of species declines (Pearson and Rosenberg 1978). However, as noted above, the effect of organic enrichment on sediment chemistry can often reduce the abundance of organisms as well as selective pressures promote a more limited suite of species adapted to low oxygen, high sulfide sediments.

For the most part, the direct effects noted above are limited in extent to the area immediately beneath a cultivation facility and its adjacent vicinity. However, some research has shown that indirect effects can also occur which can impact a larger area. For example, Inglis and Gust (2003) describe how the elevated density of predatory invertebrates such as starfish that can accumulate on the seafloor below an aquaculture facility as a result of the consistent and robust food source it provides can serve to boost reproductive rates and lead to augmented populations of predatory invertebrates on a scale that extends beyond the benthic footprint of the facility.

While site specific physical characteristics such as depth and current velocity typically do not have a large effect on the amount of biological material released from an aquaculture facility – this is typically determined by operational factors such as cultivation practices and quantities – such site characteristics play a large role in determining how concentrated discharged and dislodged biological materials become and how far they disperse (in other words, the size and severity of the facility's "footprint" on benthic habitat). Given the relatively shallow depths of the CAF operation and more limited current speed within the central part of Agua Hedionda Lagoon's outer basin, any benthic footprint would be expected to closely match the surface extent of the operation.

Although CAF's operation has been in place for many years, little information is available about the condition of the seafloor below the existing facility. CAF has stated in its application materials that no reported incidents of accumulated materials below its facility have been made during the maintenance dredging events and that the use of sediments from below its cultivation rafts for beach nourishment provides a strong indication of the high quality of these sediments. While this may be the case, direct survey results from below its five acre operation are not available for review and the absence of reported incidents in the past may not provide a guarantee that issues would not arise in the future. Additionally, the use of the sediments from below CAF's operation for beach nourishment – which also results in the dispersion and spread of these sediments throughout the open coastal area outside of Agua Hedionda Lagoon – reinforces the need for a careful approach that would help ensure that these sediments remain free from organic enrichment or debris from the aquaculture operation.

Therefore, to address the uncertainty about the existing condition of benthic habitat below CAF's operation and help ensure that an excessive accumulation of aquaculture debris and biological materials does not occur on the seafloor below it, **Special Condition 10** would require CAF to develop and implement a marine debris management plan, **Special Condition 4** would prohibit CAF from intentionally discharging waste, shell or fouling materials into the ocean, and **Special Condition 5** would require CAF to prepare and submit a benthic monitoring plan. This plan would include annual visual surveys of multiple locations below the facility for the first two years and subsequently at three year intervals. These surveys would be focused on determining whether – and if so how much - shellfish, shell material, fouling organisms, and aquaculture equipment is accumulating on the seafloor. **Special Condition 5** would also require that if during monitoring, the visible accumulation of a significant amount of oyster or mussel shell material, fouling organisms, cultivation equipment, or other project-related debris is observed, CAF shall apply for a permit amendment to adapt its operations and/or redesign its project to

avoid recurrence of these changes and to mitigate any additional impacts to marine resources that may have occurred.

Seawater Intakes

The removal of seawater through intake structures is known to result in the impingement and entrainment of marine life. The type and quantity of marine life that may be adversely affected in this way is related to the size and velocity of the intake structures. Larger, high-velocity structures can cause the impingement and entrainment of larger organisms that can include adult fish, while smaller low-velocity structures can typically only impinge and entrain smaller larval and juvenile organisms. While impingement (capture of fish and marine organisms against an intake screen due to suction) can often result in the injury or mortality of the affected organism, adverse effects of entrainment (capture of fish and marine organisms in the intake stream) vary based on the type of intake system (configuration of pipes, pressure changes, temperatures) and ultimate use of the entrained water.

As part of its proposed operations, CAF would carry out a variety of activities that would require the use of seawater extracted from Agua Hedionda Lagoon. These activities include (1) shellfish cleaning and sorting operations; (2) operation of the three FLUPSYs; and (3) operation of the depuration system and shellfish and microalgae nurseries and hatcheries. CAF proposes to pump out approximately 400,000 gallons of seawater per day from Agua Hedionda Lagoon for these activities.

Seawater use associated with operation of the FLUPSYs would be limited to the water drawn-in to upwelling tanks and troughs and immediately discharged back into the lagoon, and would therefore not include permanent removal, heating, or the pressure changes and mechanical stress that comes with movement through a long series of pipes. Because removal, heating, and mechanical stress are the primary causes of mortality for entrained organisms, the type of proposed water use associated with operation of the FLUPSYs would not be expected to result in entrainment impacts to juvenile fish and the larval and planktonic organisms within the water.

Seawater use associated with the shellfish cleaning, sorting and maintenance operations as well as the depuration system and shellfish and microalgae nurseries and hatcheries would include use of powered intake pumps and sand and UV filtration systems that would result in the mortality to juvenile fish and larval and planktonic organisms in the water extracted from the lagoon. Among the juvenile fish that may be present within Agua Hedionda Lagoon's waters is the federally endangered tidewater goby (*Eucyclogobius newberryi*).

Both the California Department of Fish and Wildlife (CDFW) and National Marine Fisheries Service (NMFS) have developed guidance and technical specifications for the use of intake structures located within water bodies in which juvenile salmonids such as steelhead are found. These guidelines are intended to protect these fish species by ensuring that intake screens are small enough to prevent their entrainment and intake velocities are low enough to not overwhelm their swimming abilities. Specifically, intake velocities are not to exceed 0.33 feet per second and mesh screening on intake structures is to be limited to 3/32 inch. The Commission has previously found these standards to reduce the potential impingement and entrainment of protected species of juvenile and adult and has required their use on a variety of shellfish

aquaculture operations that include seawater intake structures (for example, CDP Nos. E-11-029 and 9-18-0278). **Special Condition 11** would establish these intake standards for the seawater intake systems that CAF proposes to continue using for its onshore operations.

Stormwater and Water Quality

As shown in **Exhibit 1**, the site of CAF's onshore shellfish processing facility is directly adjacent to the marine waters of Agua Hedionda Lagoon. The mussel declumping station and covered work area for oyster sorting and cleaning are both located on sloped concrete areas that drain directly into the lagoon's waters. In addition, the converted shipping containers used for storage of equipment and materials such as fuels and oils are also located a short distance from the edge of the lagoon. In many respects, CAF's processing facility and onshore operations occur directly at the edge or the lagoon or with only a minimal separation distance from them.

Careful consideration must therefore be made of the activities CAF proposes to continue carrying out at this site and how these activities may allow contaminated materials to pass outside of them and into surrounding estuarine and marine waters.

Although CAF's onshore operations do not include a wide range or large quantities of hazardous materials, these operations would involve the use of fuels and oil lubricants for a variety of equipment including CAF's skiff and work barge. Fueling and maintenance operations would entail the storage, transport, and use of these hazardous materials in close proximity to the lagoon. In addition, the shellfish cleaning and processing operations CAF proposes to carry out would result in the generation of large volumes of wash water, sediments and marine fouling organisms that may pass directly into the lagoon.

To address these issues, CAF proposes to continue maintaining several grated drains within its onshore work area and also proposes to make use of large catchment basins at its mechanized shellfish cleaning stations in order to reduce the flow of materials into the lagoon. The debris that accumulates within these catchment basins would be collected and disposed of in municipal waste containers. To further limit the potential for contaminated runoff or spills to adversely affect water quality by reaching estuarine and marine waters outside of CAF's onshore shellfish processing area, **Special Conditions 9 and 12** would also require that CAF develop and submit for Executive Director review and approval both a Spill Prevention and Response Plan and a Stormwater and Runoff Control Plan. The Spill Prevention and Response Plan would be required to demonstrate CAF's ability to prevent, respond, and contain hazardous material spills, including worst case spills based on maximum proposed onsite storage volumes, and would therefore limit the potential occurrence and consequences of such spills. The Stormwater and Runoff Control Plan would be required to include a series of best management practices deemed appropriate for the project sites and proposed operations, including structural and non-structural infiltration, treatment or filtration measures for runoff from all project surfaces, measures to ensure that structural and nonstructural best management practices are routinely maintained in working condition and engineered to effectively operate in heavy storm conditions.

In addition, the Stormwater and Runoff Control Plan would also be required to outline the measures incorporated to avoid and minimize wetland and water quality impacts and to store

and/or contain materials, soils, and debris originating from the project in a manner that precludes their uncontrolled entry and dispersion into nearby coastal waters or wetlands.

Finally, **Special Condition 4** would also prohibit the discharge of aquaculture waste and materials into the lagoon and require all onshore shellfish and equipment cleaning and processing operations to be carried out in a manner that prevents the discharge into the lagoon of untreated water and biological materials.

Conclusion
With the implementation of **Special Conditions 4 through 12** described above, the Commission finds that the proposed project is consistent with Coastal Act Sections 30230 and 30231.

E. OIL SPILLS

Section 30232 of the Coastal Act states:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

The proposed project includes the operation of two marine vessels that could potentially increase the chance of a release of fuel oil into marine waters during operational activities. In addition, installation and operational activities also require the use of equipment such as hydraulically powered winches and a crane that could fail and discharge oils and hydraulic fluids into marine waters.

The first test of Coastal Act Section 30232 requires an applicant to "protect against the spillage of crude oil, gas, petroleum products, or hazardous substances..." In this case, CAF has incorporated into its project a number of measures that reduce the risk and consequences of an oil spill. CAF would make use of vegetable-based hydraulic fluid in its onboard equipment. This would reduce the potential for adverse impacts to marine wildlife and habitats in the event of a hydraulic fluid spill. Further, CAF maintains oil spill response equipment on its vessels as a standard practice and has prepared a Standard Operating Procedure for Fueling and Fuel Spill Clean Up (SOP). This SOP includes a variety of measures that would reduce the likelihood of a spill, including commitments to maintain staff at the fueling site for the duration of fueling activities, and to fuel carefully in a manner that minimizes drips onto the ground.

Notwithstanding implementation of the above-described prevention measures, accidental spills can and do occur. The second test of Section 30232 requires that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur. To meet this test the Commission typically requires an applicant to submit an oil spill contingency plan that demonstrates that the applicant has sufficient oil spill response equipment and trained personnel to contain and recover a reasonable worst case oil spill, and to restore the coastal and marine resources at risk from a potential oil spill.

Because neither of these requirements have been met, **Special Condition 9** would provide that CAF submit, for Executive Director review and approval, a Spill Prevention and Response Plan that includes identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and shoreline resources in the event of a spill; the provision of spill prevention and response equipment onboard project vessels at all times; and emergency response and notification procedures, including a list of contacts to call in the event of a spill. This Spill Prevention and Response Plan would complement the standard operating procedures and spill avoidance measures CAF currently uses and would take the form of a more typical stand-alone Spill Prevention and Response Plan that would be made available on each vessel deck for reference in the event of an incident. Such a plan would include the requisite spill notification number (the State Warning Center number 1-800-852-7550) in an easy to find location on the front page along with the appropriate list of specific local contact names and numbers that will be called. Additionally, the more typical stand-alone plan required in **Special Condition 9** would also specify the total, worst-case volume of hazardous materials on the vessels and detail the type and quantity of response equipment that would be kept available on the vessel to address such a worst-case spill.

With implementation of the measures described above and in **Special Condition 9**, the Commission finds that CAF would be undertaking appropriate measures to prevent a spill from occurring and effectively contain and respond to accidental spills that may occur. Therefore, the project is consistent with the second test of Coastal Act Section 30232.

F. ALLEGED VIOLATION

As noted above in the Summary, violations of the Coastal Act exist on the subject property, including, but not limited to, installation and use of submerged shellfish cultivation rafts, anchors, buoys, and associated in-water equipment as well as the construction, installation and use of onshore shellfish laboratories and processing facilities. In response to notification by Commission permitting and enforcement staff about these Coastal Act violations, CAF submitted this CDP application. Approval of this application pursuant to the staff recommendation, issuance of the permit, and the applicant's subsequent compliance with all terms and conditions of the permit results in resolution of the above-described violations.

Although development has taken place prior to the submission of this CDP application, consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Commission review and action on this permit does not constitute a waiver of any legal action with regard to the alleged violations, nor does it constitute an implied statement of the Commission's position regarding the legality of development, other than the development addressed herein, undertaken on the subject site without a coastal permit. In fact, approval of this permit is possible only because of the conditions included herein and failure to comply with these conditions would also constitute a violation of this permit and of the Coastal Act. Accordingly, the applicant remains subject to enforcement action just as it was prior to this permit approval for engaging in unpermitted development, unless and until the conditions of approval included in this permit are satisfied.

Failure to comply with the terms and conditions of this permit may result in the institution of enforcement action under the provisions of Chapter 9 of the Coastal Act. Only as conditioned is the proposed development consistent with the Coastal Act.

G. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with coastal development permit applications showing the application to be consistent with any applicable requirements of CEQA. Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect that the activity may have on the environment.

The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of the Natural Resources Agency as being the functional equivalent of environmental review under CEQA. The preceding CDP determination findings discuss the relevant coastal resource issues with the proposal, and the CDP conditions identify appropriate modifications to avoid and/or lessen any potential for adverse impacts to said resources. All public comments received to date have been addressed in the findings above, which are incorporated herein in their entirety by reference.

The Commission finds that as conditioned by this CDP, there are no additional feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse environmental effects that approval of the project, as conditioned, would have on the environment within the meaning of CEQA. As so, the project will not result in any significant environmental effects for which feasible mitigation measures have not been employed consistent with CEQA Section 21080.5(d)(2)(A).

Appendix A
Substantive File Documents

Coastal development permit application and supplementary letters, reports, and materials included in file no. 9-18-0163 (Carlsbad Aquafarms; commercial shellfish aquaculture facility).

Adopted Findings for Coastal Development Permit No. 9-14-0489 (University of Southern California – Wrigley Institute for Environmental Studies; oyster aquaculture research facility).

Adopted Findings for Consistency Certification No. CC-035-12 (KZO Seafarms/Catalina Sea Ranch; open-ocean commercial shellfish aquaculture facility).

Adopted Findings for Coastal Development Permit Amendment No. E-12-012-A1 (Santa Barbara Mariculture; open-ocean commercial shellfish aquaculture facility).

Adopted Findings for Coastal Development Permit No. 9-13-0500 (Hog Island Oyster Company; shellfish hatchery and nursery facility).

Adopted Findings for Coastal Development Permit No. 9-18-0278 (Grassy Bar Oyster Co.; commercial shellfish aquaculture operation)

Adopted Findings for Coastal Development Permit No. 6-17-0732 (Cabrillo Power I, LLC; Agua Hedionda Lagoon maintenance dredging)

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