McNamara, Cade

From: Ben-Aderet, Noah@CNRA <Noah.Ben-Aderet@resources.ca.gov>
Sent: Friday, February 18, 2022 9:12 PM
To: CEQAResponses
Cc: Gold, Mark@CNRA; Eckerle, Jenn@CNRA; Esgro, Michael@CNRA
Subject: OPC comments on Nordic Aquafarms DEIR
Attachments: OPC_NordicDEIR_Comments_02182022.pdf

Dear Mr. McNamara,

Please find our attached comments for the Nordic Aquafarms Draft Environmental Impact Report.
Thank you for the opportunity to comment and please do not hesitate to reach out with any questions or concerns.

Sincerely,
Noah Ben-Aderet

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February 18, 2022

Cade McNamara, Planner II
Humboldt County Planning & Building Dept.
3015 H Street
Eureka, CA 95501

RE: Comments on Nordic Aquafarms Land-Based Aquaculture Project DEIR

Dear Mr. McNamara,

Thank you for the opportunity to provide comments and recommendations regarding the Draft Environmental Impact Report for the Nordic Aquafarms land-based aquaculture project. The Ocean Protection Council, along with partner agencies, released California's Guiding Principles for Sustainable Marine Aquaculture[1] in June of 2021. The Principles support land-based/recirculating tank operations for finfish and call for ensuring sustainable aquaculture operations through a precautionary approach to siting, operating, and managing aquaculture projects.

We acknowledge the proposed project has potential to enhance economic development and create jobs in a region where such opportunities are limited. We also recognize the project has been planned with sustainability as a key component, including, but not limited to, producing fish onshore within the footprint of an existing facility and removing hazardous waste and materials from the site. Despite these acknowledgements, we have concerns around several sections of the Draft Environmental Impact Report pertaining to potential impacts to the aquatic habitats surrounding the proposed project site.

At full capacity, the Project will require approximately 2.5 million gallons per day (MGD) of freshwater sourced from the Mad River and 10 MGD of seawater sourced from Humboldt Bay. Treated wastewater (12.5 MGD) will be discharged into the Pacific Ocean utilizing the existing Redwood Marine Terminal (RMT) II ocean outfall pipe located 1.55 miles offshore of the Samoa Peninsula. A total of five buildings (intake water treatment, grow out modules, hatchery, fish processing, and wastewater treatment) will be constructed with a combined footprint of 766,530 square feet. The scope and scale of the proposed project elicit concerns that fall into four main areas: effects on the adjacent marine and bay ecosystems from water intake and discharge, effects to physical habitat (particularly eelgrass beds), water quality issues arising from effluent and discharge, and the effects of sea level rise on the project site.

In addition to the concerns listed here, OPC incorporates by reference the attached letter from the California Department of Fish and Wildlife as part of our comments because of their thorough review of specific areas of the proposed project that necessitate further study or mitigation.

Impacts to aquatic organisms
In addition to the potential impacts of construction activities, we are concerned about the direct biological impacts from the large volumes of water pumped through the plant each day (10 MGD

[1] https://www.opc.ca.gov/webmaster/_media_library/2021/06/Aquaculture-Principles-Public-20210604.pdf

from Humboldt Bay and another 2 MGD of freshwater from the Mad River). Despite specialized screens utilized in the Humboldt Bay water intakes, we are concerned about a large impact to and potential loss of larval and juvenile salmonids, longfin smelt, pacific lamprey, tidewater goby and Dungeness crab. OPC echoes the specific concerns and recommendations detailed in CDFW's comment letter and reiterates the need for a more comprehensive understanding of potential biological effects. Further discharge concerns are detailed under water quality concerns below. In light of our concerns, please provide a more detailed analysis in the final EIR alternatives on an alternative intake that pumps in sea water from the ocean side of the Samoa Peninsula. Also, a more detailed analysis of a reduced size aquaculture facility that utilizes less fresh and saltwater is needed (for example – a 6 MGD facility). Additionally, an analysis on the potential of utilization of on-site water recirculation facilities to reduce water use and impingement and entrainment impacts is needed in the final EIR. As stated earlier, the recently developed sustainable marine aquaculture principles included language supportive of land-based/recirculating tank operations for mariculture, including finfish.

Impacts to Native eelgrass

Native eelgrass (*Zostera marina*) beds are an important part of the Humboldt Bay ecosystem, with approximately 31% of the state's known mapped eelgrass habitat. Eelgrass beds are classified as a highly valuable and sensitive habitat by both state and federal statutes and are protected under state and federal "no-net-loss" policies for wetland habitats. Eelgrass provides primary production and nutrients to the ecosystem along with spawning, foraging, and nursery habitat for fish and other species. Additionally, the importance of eelgrass protection and restoration, as well as the ecological benefits of eelgrass, is identified in the California Public Resources Code (PRC §35630). OPC's strategic plan specifically highlights the need to both conserve existing eelgrass beds as well as restore additional eelgrass in order to protect valuable nursery habitats for various marine organisms as well as continue to capture carbon from the marine environment. We are concerned that the project proposal as it currently exists does not include an eelgrass monitoring or mitigation plan as well as provide sufficient assurances to protect existing eelgrass habitat in Humboldt Bay.

Impacts to Water Quality

The project proposes to treat its discharge at the Samoa Wastewater Treatment plant, which is regulated by a National Pollutant Discharge Elimination System (NPDES permit) for Peninsula Community Services District and Samoa Pacific Group Town of Samoa Wastewater Treatment Facility (Order No. R1-2020-0005) that authorizes a permitted discharge of 0.756 MGD. The proposed Aquaculture facility is anticipated to have a total maximum discharge of 12.5 MGD. While the existing ocean outfall (RMT II) utilized by two existing dischargers on the Samoa Peninsula has a total capacity of 40 MGD, it only has a permitted discharge of less than a single MGD per day: Peninsula Community Services District and Samoa Pacific Group Town of Samoa Wastewater Treatment Facility (Order No. R1-2020-0005) authorizes a permitted discharge of 0.756 MGD and DG Fairhaven Power, LLC (Order No. R1-2018-0013) authorizes a discharge of 0.350 MGD. Due to the significant increase in the volume of the proposed discharge, the water quality impacts of this discharge must be thoroughly evaluated.

Although OPC was pleased to see some detail about the wastewater treatment train for process wastewater, there were still some details lacking that should be addressed in the final EIR. The wastewater treatment plant will include moving bed biofilm reactors, MBRs and UV/ozone disinfection. If these facilities are properly designed, operated and maintained, they should provide drastic reductions in pathogen risk and in total nitrogen and ammonia mass loadings and concentrations. In order to properly assess the adequacy of the proposed facilities, please provide

the following additional information: What is the capacity of each step of treatment? What happens to plant operations in the event of an upset or membrane biofouling? In the event of a power failure, what is the maintenance plan for the facilities? Will any storage facilities be built to contain wastewater in the event of an upset or power failure? If not, is there a bypass for the inadequately treated wastewater? If so, where does the bypass discharge?

OPC is concerned that the discharge could exacerbate seasonal occurrences and risk of harmful algal blooms (HABs) and eutrophication. The Numeric Modelling Report, Dilution Study provided in Appendix E describes inorganic nitrogen and oxidized inorganic nitrogen as posing a potential risk in terms of increased ecosystem productivity/higher phytoplankton levels. The Numeric Modelling Report further found that modelled zone of potential water quality degradation (e.g., "nutrient enrichment") is seasonally dependent with elevated background levels of ammonia detected from local sources, which could exacerbate the presence of HABs and eutrophication that could harm fish, shellfish, and marine life. Section 3.9 of the draft EIR, however, describes that the risk of HABs occurrence caused by the project's proposed discharge is only "negligible." OPC requests that a complete analysis of the cumulative temporal and spatial impacts of the increased discharge be conducted, including the potential exacerbation of HABs or eutrophication caused by the proposed increased discharge. Additionally, the proposed discharge is very warm (approximately 10 degrees C above ambient ocean temperature), which coupled with high nutrient loads, could drive localized HABs. The proposed discharge is located in Dungeness crab and razor clam habitat, raising concern given both fisheries have experienced severe impacts from HABs and resulting high domoic acid levels in recent years.

OPC has additional concerns regarding the frequency of chronic toxicity testing. Section 3.9: Hydrology and Water Quality states that "[c]hronic toxicity would be sampled annually." The State Water Resources Control Board has adopted revised toxicity requirements for the Water Quality Control Plan for Inland Surface Water, Enclosed Bays, and Estuaries of California (ISWEEB) that require non-stormwater facilities that discharge 5 MDG or greater to conduct monthly – not annual – chronic toxicity tests. While the State Water Resources Control Board's Ocean Plan is yet to be amended to match the requirements of the ISWEEB, permits for facilities impacting ocean waters have already begun incorporating the updated requirements laid out in the ISWEEB Toxicity Provisions. Due to the proposed volume of the discharge and the potential impacts of unknown contaminants associated with aquaculture production, such as medicinal treatment (antibiotics, chemotherapeutants), it is recommended that the frequency of chronic toxicity testing be increased to monthly testing.

Also, considering the potential risk of pathogen releases and high nutrient discharges, the effluent monitoring requirements should be weekly for total nitrogen, ammonia, and fecal indicator bacteria for at least the first NPDES permit. And one should consider measuring virus loads in effluent on an annual basis to ensure that the disinfection process is effectively reducing viral pathogen loads to ocean waters.

Sea Level Rise Concerns

The location of the proposed project site on a low-lying barrier island raises concerns of potential impacts from sea level rise[2] (SLR), section 3.9-33 of the Draft EIR states that since the proposed project lifespan is 30 years, issues pertaining to SLR are "less than significant" and in fact could actually be beneficial by increasing the amount of time the bay-side seawater intakes are submerged during tidal fluctuations. We are concerned that this laisse-faire approach could have serious repercussions under both normal SLR scenarios as well as tsunami events similar or

[2] https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

greater to those seen in March 2011 and January 2022. We at minimum recommend further analysis of the potential impacts of SLR including scenarios that incorporate king tides and large swells on the proposed project site and associated physical structures including transportation infrastructure to and from the facility.

Thank you for the opportunity to comment on the Nordic Aquafarms California, LLC Land-based Aquaculture Project Draft EIR. If you have questions regarding this letter, please contact Noah Ben-Aderet (noah.ben-aderet@resources.ca.gov). We hope our concerns and those of the California Department of Fish and Wildlife are addressed before this project moves forward.

Sincerely,

Noah Ben-Aderet
Sustainable Fisheries and Aquaculture Program Manager
California Ocean Protection Council

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February 18, 2022

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SUBJECT: NORDIC AQUAFARMS CALIFORNIA, LLC LAND-BASED AQUACULTURE PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT
SCH# 2021040532

Dear Mr. McNamara,

The California Department of Fish and Wildlife (CDFW) received the Draft Environmental Impact Report (EIR) from the Humboldt County Planning & Building Department (County) for the Nordic Aquafarms California, LLC Land-based Aquaculture Project (Project) pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1] CDFW previously submitted comments in response to the Draft Mitigated Negative Declaration and Notice of Preparation for the Draft EIR on May 24, 2021, and July 6, 2021.

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code (FGC). The Department recognizes the proposed project has been planned with sustainability as a key component including producing fish onshore within the footprint of an existing facility, removing hazardous waste and materials from the site, and producing fish close to the consumer market. The Department also recognizes the project may enhance economic development and create jobs.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the state (FGC §711.7, subd. (a) and §1802; Pub. Resources Code §21070; CEQA Guidelines §15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of

[1] CEQA is codified in the California Public Resources Code in §21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with §15000.

those species (*Id.*, §1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources. CDFW is also responsible for marine biodiversity protection under the Marine Life Protection Act in coastal marine waters of California and ensuring fisheries are sustainably managed under the Marine Life Management Act.

CDFW is also submitting comments as a Responsible Agency under CEQA (Pub. Resources Code, §21069; CEQA Guidelines, §15381) and may need to exercise regulatory authority as provided by the FGC. As proposed, the Project may result in "take" as defined by State law of species protected under the California Endangered Species Act (CESA) (FGC, §2050 et seq.), and related authorization as provided by the FGC will be required.

Additionally, CDFW oversees and manages aquaculture activities in the State under the authority provided by the FGC (§§15000-15703) and Title 14 of the California Code of Regulations (CCR). All facilities devoted to the propagation, cultivation, maintenance, and harvesting of fish, shellfish, and plants in marine, brackish, and freshwater are required to register annually with CDFW (CCR §235). CDFW may prohibit an aquaculture operation or the culturing of any species at any location where it is determined it would be detrimental to adjacent native wildlife (FGC §15102). Similarly, the Department is authorized to review information and "ensure" that the operation will not be detrimental to native wildlife (FGC Section 15101(b)). State law also requires an Importation Permit from CDFW to import most live aquatic plants and animals, in all forms (CCR §236). Statutory authorities for aquaculture disease and aquatic animal health management are embodied in FGC (§15500 et seq.). Regulations regarding aquaculture disease controls and responses, including a list of diseases and parasites and the aquatic plants and animals they are known to infect or parasitize, are outlined in FGC (§§15500-15516) and CCR (§245).

PROJECT DESCRIPTION SUMMARY

Proponents: Humboldt County Planning & Building Department (County) and Humboldt Bay Harbor, Recreation and Conservation District (Harbor District)
Objective: Nordic Aquafarms California, LLC (Nordic) proposes to develop a land-based finfish recirculating aquaculture facility on the Samoa Peninsula and intends to cultivate all-female Atlantic salmon *(Salmo salar)* subject to CDFW approval. The Draft EIR also includes an analysis of farming alternative species, including Steelhead (*Oncorhynchus mykiss*) in seawater, Rainbow Trout (*O. mykiss*) in freshwater, and Yellowtail Kingfish (*Seriola lalandi*). The proposed aquaculture facility will include operations to grow-out fish from egg to harvestable size. The fish will be contained indoors in separate buildings connected by underground pipes for fish transfer. At full capacity, the facility will have an annual production of approximately 25,000-27,000 metric tons of head-on-gutted fish. The Project will require approximately 2.5 million gallons per day (MGD) of freshwater sourced from the Mad River and 10 MGD of seawater sourced from Humboldt Bay. Treated wastewater (12.5 MGD) will be discharged into the Pacific Ocean utilizing the existing

Redwood Marine Terminal (RMT) II ocean outfall pipe located 1.55 miles offshore of the Samoa Peninsula. A total of five buildings (intake water treatment, grow out modules, hatchery, fish processing, and wastewater treatment) will be constructed with a combined footprint of 766,530 square feet. The Project will also include ancillary support features such as paved parking, fire access roads, security fencing, stormwater management features, and a fire suppression water line. To remediate existing environmental contamination at the Project site associated with the former pulp mill (brownfield site), Project activities will include demolition of existing pulp mill infrastructure, asbestos abatement, soil remediation, and waste stream characterization, transportation, and disposal.

Location: The Project site is situated on the Samoa Peninsula, bounded on the west by dunes and the Pacific Ocean and on the east by Humboldt Bay, and located at the site of the former Samoa Pulp Mill in the unincorporated community of Samoa in Humboldt County (APN 401-112-021).

Timeline: Demolition and construction is anticipated to begin in 2022 or 2023, following final permit approvals.

PROJECT IMPACTS

Escape Risk of Atlantic Salmon

Comments: Cultivation of Atlantic salmon is unprecedented in California and carries a risk of significantly impacting the state's fish and wildlife resources, primarily via fish escape and introduction of pathogens. To avoid potential impacts associated with cultured salmon, the California legislature made it unlawful to spawn, incubate, or cultivate any transgenic or exotic species of finfish belonging to the family Salmonidae in the waters of the Pacific Ocean regulated by the state (FGC §15007). While land-based facilities are generally regarded as posing substantially fewer risks to the local environment than marine net pens, the proximity of the Project site to Humboldt Bay and the Pacific Ocean, coupled with the proposed seawater intakes and discharge of effluent into the Pacific Ocean, is concerning.

The Project is also being proposed in a region that is home to some of the State's most commercially and culturally significant runs of wild Pacific salmon, some of which are also at risk of extinction. This includes State- and/or federally protected (threatened) runs that return to the Project's immediate vicinity, like Southern Oregon/Northern California Coastal (SONCC) coho salmon that spawn in tributaries to Humboldt Bay or California Coastal Chinook (CCC) salmon and Northern California (NC) summer steelhead that spawn in the Eel and Mad Rivers. Central California Coast (CCC) coho are also potentially at risk as they spawn in rivers of Mendocino County directly to the south. The State's largest wild run of fall Chinook salmon spawns in the nearby Klamath Basin, approximately 45 miles to the north, and their progeny rear in coastal waters immediately adjacent to the Project. The Klamath Basin is also home to one of the largest riverine restoration projects in the world, which is focused primarily on helping dwindling runs of wild Pacific salmon. Steelhead and Longfin Smelt are also important and vulnerable components of the region's anadromous fish fauna. This setting is one in which any increase in risk to native fish – regardless of

magnitude – or any addition of novel stressors – imperceptible, uncertain, or otherwise – must be weighed carefully and may ultimately be unacceptable.

The Draft EIR concludes that the risk of cultured Atlantic salmon escaping from Project facilities is eliminated by multiple physical barriers and water treatment barriers (e.g., jump screens on tanks, grates in the drainage system, 0.04µm membrane filter screens, and ultraviolet light in the wastewater treatment plant) and by using underground pipes to move fish between buildings (pg. 3.3-25). CDFW appreciates the additional measures that have been included to minimize the risk of escape, including designing the facility to meet tsunami design standards, biosecurity measures, and the development of an Escape Response and Reporting Plan. The Project has also reduced the risk of escaped fish from reproducing and establishing in the wild by committing to cultivating all-female fish.

CDFW understands that the potential for cultured Atlantic salmon to escape from the facility into local marine, estuarine, and freshwater environments is low, but does not consider the risk to be eliminated, and is concerned with the potential consequences of an escape event to vulnerable, native species. As noted in CDFW's previous comments responding to the Draft MND, the Project's proposed location is subject to seismic and tsunami hazards and may hold millions of Atlantic salmon as close as 300 feet from Humboldt Bay at any one time. Even well-designed land-based facilities outside of tsunami hazard areas have had unintended releases due to structural or operational failures (Føre and Thorvaldsen 2021). Additionally, biosecurity measures are fallible; the risk of intentional or unintentional release of fish cannot be completely eliminated. Cultivating all-female fish would effectively eliminate the potential for fish to reproduce and establish in the wild, but any escaped individuals may still prey upon or compete with native fauna until they themselves perish (Waknitz et al. 2003; Naylor et al. 2005; Morton & Volpe 2002; ADFG 2002). The Draft EIR does not analyze the potential for escaped Atlantic salmon (or the alternative species) to compete with native species for food or habitat resources or consume them as prey. Additionally, the Draft EIR does not analyze the potential for escape to occur during transportation of eggs to the facility. Escapes have been documented during transportation from other land-based facilities (Føre and Thorvaldsen 2021).

Fish Olfaction and Homing

Comments: Beyond concerns surrounding the physical escape of Atlantic salmon from the facility, it is unclear whether these fish will have a 'biochemical presence' in adjacent marine waters, via the release of 12 MGD of effluent from the facility. This is a critical uncertainty that must be addressed because the artificial manipulation of olfactory cues in the environment can disrupt salmon migrations (e.g., Drenner et al. 2018), and local streams are home to runs of native salmon or steelhead that are of conservation concern (e.g., state and federally listed coho salmon in Freshwater Creek, a tributary to Humboldt Bay) or that support important fisheries (e.g., Chinook Salmon in the Klamath Basin to the north).

Recommendations:

- The Final EIR should analyze the potential consequences of an escape event, including escaped fish competing with native species for food and habitat resources or consuming them as prey. The analysis should assess impacts as it relates to the preferred species (Atlantic salmon) and alternative species to determine if impacts can be reduced based on species selection. Additional measures to reduce impacts to native species should be considered, such as cultivating triploid Steelhead, Rainbow Trout, and Yellowtail Kingfish to eliminate the risk of hybridization and establishment.
- The Final EIR should analyze the potential for escapes to occur during transportation of eggs to the facility.
- To ensure any escaped fish from the facility are unable to reproduce in the wild, CDFW recommends the Final EIR include the development of a QA/QC program to verify that all fish from each cohort are female.
- The Final EIR should address the potential for olfactory disruption to native salmonids resulting from the facility's discharge of pheromones or other chemical cues that influence homing or migration, including consideration of how the facility's wastewater treatment system may or may not eliminate these compounds.

Introduction of Pathogens to Native Fish

Comments: Pathogens associated with cultured Atlantic salmon from the Project may be transmitted to wild salmonid populations, an impact that could persist within native populations even if Atlantic salmon are unsuccessful at establishing reproductively viable populations (Mordecai et al. 2021; Morton & Volpe 2017). Pathogens may be introduced through egg importation, wastewater discharge at the ocean outfall (if not effectively treated or due to accidental spills/leaks), catastrophic flooding events, improper disposal of carcasses, and pathogens carried outside the facility on equipment or personnel. Existing regulations require that applications to import eggs of fishes of the family salmonidae shall be accompanied by a health certificate signed by a person competent in the diagnosis of fish diseases stating that the hatchery or other sources of the eggs to be imported and the eggs themselves are free of the following diseases for a minimum of two consecutive years: infectious pancreatic necrosis; bacterial kidney disease; infectious hematopoietic necrosis; and viral hemorrhagic septicemia. In questionable cases, CDFW shall determine whether the person making the certification is technically qualified to do so (CCR § 236(7)). In addition to the above list of pathogens, CDFW will also require the hatchery or other sources of eggs to be imported and the eggs themselves to be free of other diseases of concern specific to the species being farmed for a minimum of two consecutive years, such as piscine orthoreovirus and infectious salmon anemia virus.

The Draft EIR includes measures to minimize the risk of pathogens entering and exiting the facility. The Project intends to import Atlantic salmon eggs from a source hatchery that is shown to be free of significant pathogens of concern for a minimum of two years; however, a source hatchery that meets the above criteria has not been identified. Nordic also proposes a procedure to disinfect imported eggs, including twice at the source hatchery and a third time at the Nordic facility while in quarantine. The Draft EIR proposes that any cohort of fry must be declared free from evidence of all diseases of regulatory

concern and approved by CDFW before being transferred out of the quarantine area. CDFW acknowledges that this is a proposed approach and recommends coordination with CDFW in developing a Fish Health Monitoring Plan that specifies at least the necessary implementation details shown in the Recommendations below.

Before being discharged into the Pacific Ocean, effluent from the facility will go through a wastewater treatment system which includes UV disinfection to neutralize pathogens. The effective dose of UV light to sterilize pathogens varies. Effective dose is determined by the intensity of the UV lamp, cleanliness of the quartz sleeve separating water from the UV lamp, the contact time and flow rate of the water flowing through the UV system, water clarity, as well as the size and biological characteristics of target pathogens (Yanong and Erlacher-Reid 2012). Design specifications and permit conditions relying on UV treatment should include minimum dosages as well as minimum operating standards reflecting the above concerns to ensure that effective UV treatment occurs. The Project proposes to use a 300 millijoule (mJ) end of lamp life UV dose before water is discharged to sterilize pathogens but does not specify the minimum operating standards mentioned above to ensure effectiveness. The Draft EIR also does not disclose the effective UV dose to neutralize potential pathogens of concern specific to Atlantic salmon or the alternative species.

Recommendations:

- CDFW recommends the Final EIR include a list of pathogens and parasites of concern specific to the preferred and alternative species being considered, and the required UV dose to inactivate them. Also included should be further details on the operation and maintenance plans to ensure effectiveness of the UV system, including minimum requirements for water clarity, contact time, flow rate, and quartz sleeve cleanliness, and confirmation that design specifications address the size/biological characteristics of target pathogens.
- CDFW recommends the Final EIR include the development of a Fish Health Monitoring Plan in cooperation with CDFW that specifies the frequency and number of fish at various life stages that are tested for listed pathogens and parasites, approved parties and methods used for testing, and identifies which pathogens and parasites are being tested for. The Plan should include specific responses such as immediate reporting (within 24 hours) of detections to CDFW as well as those measures directed by existing regulations (CCR §245). The Plan should also include an annual Fish Health Monitoring Report that summarizes measures taken to screen for and minimize the risk of pathogens and parasites, fish health issues experienced in the facility, and measures taken to treat/address those issues. The annual report should be provided to CDFW.

Transportation & Disposal of Fish Waste

Comments: Nordic's facility will produce a significant amount of fish waste, requiring 32 truckloads per week to dispose of waste to "various secondary processing sites within 150 miles of the facility" (pg. 2-27). The Final EIR should include further details about the location and safe disposition of fish waste and assess the environmental impacts associated with storage, handling, processing, transportation, and disposal of fish waste. CDFW is especially concerned with the potential transfer of pathogens or other

environmental impacts that could occur during transportation (e.g., spill from trucks) and disposal of fish waste at undisclosed location(s).

Recommendations:

- As recommended in previous comments, the Final EIR should include the location(s) of waste disposal and an analysis of environmental impacts from storing, handling, processing, transporting and disposing of fish waste. Impacts may include but not be limited to onsite impacts, disposal site(s), potential for spills during transportation, and transfer of pathogens during transportation and disposal.

Entrainment from the Seawater Intakes & Compensatory Mitigation

Comments: The Harbor District proposes to upgrade and permit two seawater intakes in Humboldt Bay, with a combined maximum withdrawal capacity of 12 MGD. As mentioned in previous comment letters and during interagency meetings, CDFW is concerned with entrainment of CESA-listed Longfin Smelt (LFS; *Spirinchus thaleichthys*) and other larval organisms. The Draft EIR assumes LFS larvae are only susceptible to entrainment when salinity levels at the intakes are below 12 practical salinity units (psu), which is estimated to occur 0.014% of the time (pg.7, Appendix Q). However, LFS larvae have been observed in salinities higher than 12 psu in Humboldt Bay, including near the proposed intakes. During a CDFW-led study in 2017, a total of 25 LFS larvae (6.05-8.81 mm in body length) were collected at three different sampling locations in Arcata Bay (Ray & Bjorkstedt unpublished data). Salinity, measured at the surface and bottom, ranged from 11.36-30.24 psu during collections. During this study, four of the LFS larvae (6.98-7.25 mm in body length) were caught at a sampling location just south of the proposed intake locations (40.792254°N, -124.193258°W) on two different sampling events (January 26, 2017 & February 23, 2017) when salinity conditions ranged from 26.35-30.24 psu. Additionally, sampling conducted by Inner City Fund in 2020 collected LFS larvae (~7-8 mm) at salinities greater than 22 psu in the Eel River Estuary (ICF 2020). These observations suggest that the salinity tolerance of LFS larvae in Humboldt Bay and the Eel River Estuary could exceed the tolerance limits of other populations, such as LFS in the San Francisco Estuary.

The Harbor District anticipates obtaining an Incidental Take Permit from CDFW for take coverage of LFS and proposes off-site habitat restoration to mitigate for entrainment impacts. Compensatory mitigation will also be required by the California Coastal Commission (CCC) for impacts to biological productivity from the intakes, including entrainment of Pacific herring, northern anchovy, Dungeness crab, and other larvae. The total area of habitat restoration required to mitigate for impacts to LFS and biological productivity will be based on the results from the Intake Assessment Study that will be completed in 2023, but the Draft EIR includes a proposed mitigation approach. The Harbor District's habitat restoration proposal includes pile removal in the South Bay (at the former Kramer Dock site) and Spartina removal at an undisclosed location in Humboldt Bay. The Harbor District proposes to implement the mitigation using a phased approach: 1) For cumulative water withdrawal between 0-694 gallons per minute (gpm), no compensatory mitigation is proposed; 2) For cumulative water withdrawal between 695-1,250 gpm, impacts to biological productivity will be mitigated by restoring up to one acre of tidal wetlands in Humboldt Bay through the eradication of *Spartina densiflora* or removal of an

equivalent number of piles; and 3) For cumulative water withdrawal between 1,251 to 8,250 gpm, additional piles will be removed at the Kramer Dock site. CDFW is concerned that the Draft EIR does not analyze the potential entrainment of LFS during the initial water withdrawal phase (0-694 gpm) or propose any mitigation to offset entrainment impacts. To mitigate for impacts to LFS, the Harbor District proposes to restore one square meter of habitat per ~295 larvae impacted by removing four pilings at the Kramer Dock site. This mitigation approach assumes the annual production of one female is 295 surviving larvae and each spawning female requires less than one square meter of habitat to spawn (the latter statement is not cited, Appendix N). However, pile removal at the Kramer Dock site will not provide additional spawning habitat since LFS do not spawn in this region of the Bay. While removing contaminated pilings will provide water quality benefits to Humboldt Bay, CDFW is concerned this approach is not sufficient to mitigate for impacts to LFS. The Draft EIR states it is unlikely that spawning habitat for LFS is limited in Humboldt Bay and contaminants are a greater concern (pg. 6, Appendix N). However, this statement is not supported by citations. Population declines of LFS are likely due to loss of tidal wetland habitats and changes in freshwater flows (Garwood 2017; CDFG 2009; California Department of Water Resources et al. 2020). A habitat restoration approach that benefits the life history stage being impacted will be necessary to ensure impacts to the species are fully mitigated.

To mitigate for impacts to biological productivity, the Harbor District proposes to receive four acres of mitigation credit for every one acre of habitat restored at the Kramer Dock site. This mitigation approach includes credit for the surface area of the pile removed, rather than the benthic footprint of the pile. For example, if the Area of Production Forgone to biological productivity from the intakes is calculated to be 10.4 acres, the Harbor District proposes an area of piling removal equivalent to 2.6 acres (Appendix N). CDFW is concerned this mitigation approach is not sufficient to offset impacts to biological productivity.

Recommendations:

- The LFS entrainment impact analysis should not assume larvae are only susceptible to entrainment when salinity is <12 psu. In the absence of understanding the physiological limits of LFS larvae in Humboldt Bay and given there have been multiple observations of LFS larvae in high salinity waters, CDFW recommends that LFS larvae are assumed to be viable in all of Humboldt Bay, regardless of salinity conditions.
- The Final EIR should analyze the potential take of LFS at each phase of water withdrawal. If take of LFS could occur during the initial phase of up to 694 gpm, then mitigation to offset impacts will be required.
- CDFW recommends mitigation for impacts to LFS, and biological productivity be provided in full and upfront, rather than the proposed phased mitigation approach.
- To fully mitigate for entrainment impacts to LFS, CDFW recommends additional or alternative mitigation that directly benefits the life history stage of LFS being impacted, such as protection or creation of spawning and/or rearing habitat. CDFW also recommends additional mitigation to compensate for loss of biological productivity. CDFW recommends that the Harbor District continue to engage with CDFW, CCC, National Marine Fisheries Service (NMFS) and other regulatory

agencies in the development of an effective habitat restoration and mitigation plan prior to finalizing the EIR.

- Specific information on where Spartina removal will occur needs to be disclosed to determine the benefits of this mitigation approach to species impacted by entrainment.
- CDFW recommends a work window of July 1 – October 15 during pile removal activities to minimize impacts to listed salmonids.
- To avoid potential impacts to nesting birds on or near the pilings, CDFW recommends an avoidance mitigation measure, such as pile removal during the non-nesting season or pre-demolition nest surveys with specified no-disturbance buffers for active nests.

Seawater Intakes Screen Design, Operations & Maintenance

Comments: The intake screens have been designed to meet NMFS and CDFW's fish screening criteria. However, other than the mention of using an air burst or brush system self-cleaning technology while operating, the Draft EIR does not include details on how the screens will be cleaned and maintained to avoid changes in approach velocity and risk of impingement. CDFW has provided the Harbor District with concerns related to air burst cleaning systems, which in some circumstances may not be as effective as brush cleaning and can cause problems with meeting the fish screen hydraulic criteria of low approach velocities with hydraulic uniformity. Reliance on a 0.1-ft hydraulic head differential in the intake structures, additive to an estimated 0.44-ft minimum hydraulic head differential, to activate the screen cleaning system is not likely to indicate concentrated areas of biofouling on the screen surface that can then lead to areas of higher approach velocity and hydraulic non-uniformity. CDFW is concerned with the risk of impingement if the screens are not properly maintained. Frequent, regularly scheduled activation of the cleaning system and detailed visual inspection, including the inside of the screen, may be needed to ensure that this requirement is met for the life of the Project.

Recommendations:

- The Final EIR should include the development of an Operations & Maintenance Plan for both intakes that will provide details of the proposed self-cleaning technology, including how often the screens will be self-cleaned, manually checked for debris buildup and biofouling, and how the Harbor District will ensure the cleaning technology is always functioning properly. Additionally, the Operations & Maintenance Plan should provide sufficient detail on how the screens will be evaluated for effectiveness to verify hydraulic design objectives are achieved. A phased evaluation period of the screen cleaning system can be used to determine the program for frequency of visual inspections and cleaning cycles that help to ensure adherence to the hydraulic criteria. The Operations & Maintenance Plan should be provided to regulatory agencies for review and approval prior to final design and permitting of the intakes. CDFW recommends the Harbor District analyze the effectiveness of alternative cleaning systems, including self-cleaning brush technology, to ensure consistency of providing lower approach velocity and hydraulic uniformity near the fish screen which minimizes the chance for fish/larvae impingement and entrainment.

- The Draft EIR and Appendix R describes that the existing RMT II dock intake structure is constructed of wood that has become deteriorated and will likely need repairs to seal cracks that would allow flow into the intake structure other than through the intake screen. CDFW recommends the Harbor District provide a final design of how this intake structure will be completely sealed to ensure all pumped flow will go through the screen. The Draft EIR also describes that the existing Red Tank dock intake concrete structure appears to be in functional condition and minor repair, or cleaning may be necessary to bring this structure back into service. CDFW recommends the Harbor District provide information on how this intake structure will be completely sealed to ensure all pumped flow will go through the screen.

Ocean Outfall Wastewater Discharge
Comments: At full capacity, the facility will discharge 12.5 MGD of treated effluent 1.55 miles offshore via the existing RMT II ocean outfall diffuser. The outfall diffuser is located approximately 82 feet below the surface in sandy habitat. The temperature of the discharge effluent will range between 68 to 72°F, approximately 20°F above the average ambient temperature of 51.8°F, with a salinity of 27 psu (compared to an ambient salinity of 33.5 psu). Based on the results from the Project's dilution modeling study, the dilution targets for temperature and salinity are expected to be met within five feet of the diffuser. However, the modeling study relies on oceanographic data that was collected near the entrance of Humboldt Bay, over three miles from the discharge location. The wastewater treatment facility is expected to remove 99% of biological oxygen demand, total suspended solids, and phosphorus, and 90% of nitrogen prior to discharge, but the Draft EIR does not describe how these water quality parameters will be measured to ensure the treatment design specifications are met.

Nordic proposes to conduct baseline water quality and biological monitoring at the ocean outfall location one to two years prior to discharge to characterize pre-discharge conditions. Post-discharge monitoring will be conducted over three to five years once the facility is discharging at full capacity using the same methods as baseline monitoring. The monitoring program will include collection of oceanographic data using an acoustic doppler current profiler to measure current velocities, and the use of a conductivity, temperature, and depth profiler to characterize spatial patterns of temperature and salinity. Surface and benthic water quality monitoring of nutrients, suspended solids, turbidity, and chlorophyll will be conducted at half of the profiling stations. Benthic biological transect surveys will occur concurrently with water quality monitoring, using either a remotely operated vehicle and/or a drop camera with laser lights for scale. Surveys will be conducted along the discharge pipe, within the zone of influence, and at reference sites. Baseline and post-discharge monitoring will include two annual survey events, separated by at least two weeks, during the summer/fall. The Draft EIR does not include implementation of a mitigation plan in the event that impacts to water quality or biological communities are observed.

Recommendations:

- CDFW recommends collecting a minimum of two years of baseline data to capture interannual variability in ocean conditions.
- Before the facility can begin discharging, CDFW recommends the discharge modeling study (dilution study; Appendix E) be updated and reanalyzed using the baseline oceanographic data collected at the discharge location. The results from the updated dilution study should be provided to CDFW and other regulatory agencies for review prior to the facility using the ocean outfall.
- CDFW recommends post-discharge monitoring commence once the facility begins using the ocean outfall, rather than after the facility is discharging at full capacity. Continuous monitoring (at least twice per year) will provide necessary data on potential impacts of the discharge to receiving water quality and biological communities as the quantity of the facilities discharge increases over time.
- CDFW recommends sediment samples be collected at the discharge location, within the zone of influence, and at reference locations pre- and post-discharge to assess the accumulation of contaminants, including harmful algae bloom-associated toxins, in the benthic environment.
- CDFW recommends water quality and biological monitoring occur at least twice per year to capture annual variability in oceanic conditions and biological community structure (e.g., during both the upwelling and relaxation seasons), rather than the proposed two sampling events during the summer/fall.
- CDFW recommends the Final EIR include a wastewater discharge mitigation plan developed in consultation with CDFW, North Coast Regional Water Quality Control Board, CCC, NMFS and other relevant regulatory agencies. The plan should include a description of mitigation measures that will be immediately implemented if impacts to water quality (e.g., Ocean Plan water quality objectives are not met) or biological communities associated with the wastewater discharge are observed.
- CDFW recommends the Final EIR include a table of all pre- and post-discharge water quality and biological monitoring. The table should include the monitoring location (approximate GPS and distance from the diffuser), method, parameters measured, and number of replicate samples/surveys. Additionally, CDFW recommends the Final EIR include a map of the Ocean Discharge Study Area that includes water quality and biological monitoring locations in relation to the ocean outfall diffuser.

Eelgrass Habitat

Comments: Native eelgrass beds (*Zostera marina*) are an important part of the Humboldt Bay ecosystem and are recognized by state and federal statutes as both highly valuable and sensitive habitats. Humboldt Bay holds approximately 31% of the known mapped eelgrass in the state (Merkel & Associates 2017). Eelgrass provides primary production and nutrients to the ecosystem along with spawning, foraging, and nursery habitat for fish and other species. Pursuant to the federal Magnuson-Stevens Fishery Conservation and Management Act, eelgrass is designated as Essential Fish Habitat for various federally managed fish species within the Pacific Coast Groundfish and Pacific Coast Salmon Fisheries Management Plans (FMP). Eelgrass is also considered a habitat area of particular concern for various species within the Pacific Coast Groundfish FMP. Eelgrass habitats are further protected under state

and federal "no-net-loss" policies for wetland habitats. Additionally, the importance of eelgrass protection and restoration, as well as the ecological benefits of eelgrass, is identified in the California Public Resources Code (PRC §35630).

Eelgrass habitat occurs within the Kramer Dock pile removal mitigation site. CDFW is concerned with potential direct and indirect effects to eelgrass during proposed pile removal activities. The only mitigation measure included in the Draft EIR is to remove piles during a tide of sufficient elevation to float the barge and tugboat without scarring mudflats or injuring eelgrass (pg. 3.9-29). The Draft EIR does not include an eelgrass monitoring or mitigation plan.

Recommendations:

- CDFW recommends the Final EIR analyze the potential impact to eelgrass habitat from pile removal activities. Impacts to eelgrass should be avoided and minimized to the fullest extent possible. To ensure no net loss, CDFW recommends the Final EIR include the development of an eelgrass monitoring and mitigation plan, as defined in the California Eelgrass Mitigation Policy (CEMP; NMFS 2014). The plan should include pre- and post-construction surveys to map eelgrass habitat at the Kramer Dock pile removal site. Surveys should be conducted by a qualified biologist during the high growth season (May-September) and follow the standards of the CEMP. This plan should include mitigation for any impacts to eelgrass. Additionally, the Final EIR should include additional eelgrass avoidance measures, such as avoiding anchoring in eelgrass habitat during pile removal activities.

Use of Explosives and Nesting Birds

Comments: Native birds, particularly their nesting stages, are protected pursuant to FGC sections 2000, 3503, and 3503.5. Effects of structure demolition, including use of explosives, to nesting birds is discussed in the Draft EIR (pg. 3.3-17), stating, "*noise generated by demolition activities would attenuate below 140 dBA (the threshold to avoid hearing damage in birds; Dooling and Popper 2007) at 130 feet from the blast*". However, the Draft EIR Construction Noise, Vibration, and Hydroacoustic Assessment (Appendix J) also discusses a worst-case scenario where air-overpressure levels ranged from 142 to 150 dB(L) at distances of approximately 800 to 1,100 feet, and 141 to 142 dB(L) at distances of 1,300 to 1,500 feet. Given the range of building demolition noise scenarios presented in the Draft EIR and appendices, building demolition timing outside the nesting bird season would provide the greatest certainty in avoiding harm to nesting birds.

Recommendations:

- CDFW recommends Mitigation Measure BIO-5 (Protect Special Status, Migratory, and Nesting Birds) be revised to avoid use of explosives during the nesting bird season. Alternatively, if explosives will be used during the nesting season, the Final EIR should provide further analysis or clarification of explosion sound pressure distances that may result in bird hearing damage or nest failure.

Osprey Nest Management

Comments: Native birds, particularly their nesting stages, are protected pursuant to FGC sections 2000, 3503, and 3503.5. CDFW observations in recent years indicate two osprey

(*Pandion haliaetus*) pairs each have a nesting territory on the Project site. To avoid potential impacts to osprey, the Draft EIR (pg. 3.3-20) states, "*The Harbor District is actively working with CDFW to relocate Osprey nests from the Project Site*". Current and future osprey nest management to avoid impacts due to Project-related changes to the physical environment should be analyzed in the Final EIR.

Recommendations:

- The Final EIR should revise Mitigation Measure Bio-5 (Protection of Osprey) to include an Osprey Management Plan for current and potential future nests. The Osprey Management Plan should include performance criteria such as no-net-loss of osprey breeding territories with sufficient alternative nest sites within the Project area, and that any created nest sites are of equal or higher quality than nests removed.

Alternatives Analysis

Comments: The Draft EIR includes an analysis of alternatives for the facility location, species farmed, and seawater sources. The only alternative facility locations that are briefly analyzed in the Draft EIR include other locations within the Humboldt Bay area. The Draft EIR mentions that twelve other west coast communities were considered in the initial search for a site but does not disclose the location of those sites or an explanation for why those sites are not considered further. Additionally, there are no alternatives related to a reduced size facility.

The alternative species analyzed include Steelhead in seawater, Rainbow Trout in freshwater, and Yellowtail Kingfish, in addition to the preferred species of Atlantic salmon. There are several sections of the species comparison table (Table 4-2) that lack citations, such as the feed conversion ratios, biological risks, and survivability and hybridization with local species in the event of escapement. The Draft EIR does not include an analysis of pathogens and parasites associated with the alternative species or discuss the volume of seawater and freshwater that would be used for alterative species and the environmental impacts associated with that water use. It is mentioned that the alternative species would result in higher production of nutrients and feces, but there is no analysis of impacts to receiving water quality or marine resources from the discharge. Local concerns regarding Steelhead are included, but Table 4-2 does not include local concerns regarding Atlantic salmon or the other alternative species. Additionally, the analysis does not include measures to minimize risks associated with the alternative species, such as cultivating triploid fish to avoid hybridization and reproduction.

The alternative seawater sources include slant wells, an oceanic seawater intake, and Humboldt Bay seawater wells. The analysis suggests that impacts from any of these alternatives would be less than significant with the incorporation of mitigation measures. However, the Draft EIR does not discuss the potential impacts to marine and terrestrial resources from constructing and operating the alternative seawater sources or the mitigation measures that would be implemented to offset potential impacts, such as entrainment and impingement.

Recommendations:

- CDFW recommends the Final EIR analyze additional alternative Project locations that have less potential risk for fish and pathogens to escape into marine, estuarine, or freshwater habitats used by native salmonids. CDFW also recommends the Final EIR include a reduced facility size alternative.
- CDFW recommends Table 4-2 be revised to include citations and incorporate local concerns regarding cultivation of Atlantic salmon that have been provided during the public review.
- CDFW recommends the Final EIR include a comparative analysis of potential pathogens and parasites specific to Atlantic salmon and the alternative species.
- CDFW recommends the Final EIR include measures to reduce risks associated with the alternative species, such as cultivating triploid fish to minimize risk of hybridization and reproduction.
- CDFW recommends the Final EIR include a comparative analysis of entrainment and impingement impacts associated with each of the alternative seawater sources.

Mandatory Findings of Significance & Mitigation Monitoring and Reporting Program (MMRP)

Comments: The Draft EIR does not include a Mandatory Findings of Significance or MMRP table.

Recommendations:

- CDFW recommends the Final EIR include a Mandatory Findings of Significance and MMRP table.

CONCLUSION

We appreciate the opportunity to comment on the Nordic Aquafarms California, LLC Land-based Aquaculture Project Draft EIR to assist the County, Harbor District, and Nordic in identifying and mitigating Project impacts on biological resources. Questions regarding this letter or further coordination should be directed to Corianna Flannery, Environmental Scientist at 707-499-0354 or Corianna.Flannery@wildlife.ca.gov.

Sincerely,

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