CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
NORTH COAST REGION
RESOLUTION NO. R1-2025-0003

APPROVAL OF MONITORING OF COASTAL OCEANOGRAPHY AND WATER QUALITY WORK PLAN AND BIOLOGICAL SURVEY FOR NORDIC AQUAFARMS CALIFORNIA, LLC, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM ORDER NO. R1-2023-0019

WHEREAS: the California Regional Water Quality Control Board North Coast Region, (Regional Water Board) finds that:

BACKGROUND

1. On October 5, 2023, the North Coast Regional Water Quality Control Board (Regional Water Board) adopted National Pollutant Discharge Elimination System and Waste Discharge Requirements for Nordic Aquafarms California, LLC, in Order No. R1-2023-0019 (Order). Nordic Aquafarms California, LLC (Permittee) is the owner and operator of Nordic Aquafarms California (Facility), a land-based aquaculture and fish processing facility. The Facility has yet to be constructed and will be located on the eastern shore of the Samoa Peninsula, east of New Navy Base Road, and due west, across Humboldt Bay, from the City of Eureka in Humboldt County.
2. The Permittee is authorized to discharge 10.3 million gallons per day (MGD) through a 48-inch, 64 port diffuser outfall that terminates approximately 1.5 miles offshore in the Pacific Ocean. The discharge pipe is owned and maintained by Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD). HBHRCD is a Co-Permittee with Nordic in the above-mentioned Order. HBHRCD is solely responsible for the Construction, Operation and Maintenance Specifications for the Intake System and Ocean Outfall as identified in section 6.3.5. and the Mitigation Project for Intake Structures in section 6.3.7.3 of the Order. All other requirements in the Order are the sole responsibility of Nordic Aquafarms California, LLC.

Order Requirements for Monitoring of Coastal Oceanography, Water Quality and Biological Survey Work Plan

3. As a condition of its approval of the Order, the Regional Water Board required to submit, for the Regional Water Board's approval, a "Monitoring of Coastal Oceanography and Water Quality" Work Plan (section 6.3.2.3. of the Order) (MCOWQ Work Plan). The MCOWQ Work Plan also includes a requirement for the Permittee to perform a "Biological Survey" as described in section 8.2 of the

Monitoring and Reporting Plan. This Resolution approves the MCOWQ Work Plan that includes a supplemental Biological Survey as required by the Order.

4. The MCOWQ Work Plan is required to be submitted two years prior to first discharge from the Facility and is subject to a 30-day public comment period associated with this Resolution. This additional monitoring program is required to understand interannual variability (e.g., cool vs warm years) and shall commence with pre-discharge baseline monitoring. Baseline monitoring shall commence one to two years prior to beginning discharge from the facility. Post discharge receiving water monitoring shall commence following completion of Phase 1 operations following the same methodology as the baseline monitoring. The post-discharge monitoring shall continue for three years to provide “before-after-control impact” or “before-after-gradient” design for the biological monitoring program. The monitoring program shall be conducted during the summer/fall period of upwelling “relaxation,” when mixing conditions due to upwelling velocities are least energetic, and dilution of the discharge would thus be lowest. Two annual surveys shall occur during the summer/fall period, ideally in August or September, separated by at least two weeks.

   The Order requires oceanographic data to be gathered with an acoustic doppler current profiler (ACDP) to measure current velocities (deployment and retrieval during the first and second surveys of each year, respectively), and the use of a conductivity, temperature, and depth (CTD) profiler to characterize spatial patterns of temperature and salinity of the ambient waters and any effects in proximity to the discharge. Water quality monitoring of nutrients (NHx, NOx, TN), suspended solids and turbidity, and chlorophyll a shall be conducted during each survey to confirm the predicted area of effect.

   In addition to the sampling required in Attachment E of the Order, supplemental biological surveys shall be conducted to determine if the effluent discharge is having a significant effect on biota in the Ocean Discharge Study Area, defined as the proximal marine waters. Supplemental biological surveys shall occur concurrently with water quality monitoring. The study approach shall utilize visual methods, either a remotely operated vehicle (ROV) and/or a drop camera with laser lights for scale. Transects and point surveys shall be conducted at a height of two to five feet above the bottom. Surveys shall be conducted outside of the zone of influence for this time period (e.g., reference sites), and within the zone of influence, and along the discharge pipe, at approximately the 82 feet (25 meter) isobath.

   The Biological Survey requires a biologist to prepare a report of observations, including objectionable aquatic growths, floating particulates or grease and oil, aesthetically undesirable discoloration of the ocean surface, color of fish or shellfish, and any evidence of degradation of indigenous biota attributable to the rate of deposition of inert solids, settleable material, nutrient materials, increased concentrations of organic materials, or increased concentrations of Ocean Plan Table 3 substances. Nordic Aquafarms California, LLC shall submit to the Regional Water Board Executive Officer for approval by the Regional Water Board a Biological Survey Work Plan no later than two years prior to first discharge, in order to complete the survey and prepare a final report by the due date for receipt of an application for permit renewal. The Biological Survey Work Plan will also be subject

to a 30-day public comment period. The final report shall be submitted no later than December 1, 2027.

Permittee Proposal for Monitoring of Ocean Water Quality Work Plan and Biological Survey

5. The Permittee proposes to obtain water column current data that can be used to further support and confirm the results of a previously run dilution model for the outfall and evaluate outfall sheer stress effects on plankton, examine water column profiles to assess turbidity, temperature, conductivity, salinity, and pH, collect water samples to quantify nutrients and suspended solids, document the occurrence of harmful algal bloom (HAB) causing taxa in the receiving water, and assess any potential changes to the marine benthic community and water column nutrient levels that may be occurring within seasons, between seasons, and between years from the outfall's combined discharge.
6. Sampling will be conducted by marine scientists from Applied Marine Sciences (AMS) using Cal Poly Humboldt University's Marine Research Vessel, the RV Coral Sea, during daylight hours. Monitoring will occur four times annually during two different sampling seasons: February-April and July-September. Sampling efforts within the same season will be conducted a minimum of four weeks apart to capture any within season variability. Sampling will be conducted for two years prior to the Permittee's first discharge and will continue for three years following the first discharge. This monitoring effort will focus on collecting data and gaining local information pertaining to three main areas: local current patterns, water quality, and benthic habitat and biota.
7. Site-specific current profiling data will be collected to verify potential impacts of shear stress on plankton due to the discharge of effluent at the Ocean Outfall. Applied Marine Sciences will work with Delphis Technical Support & Solutions, LLC. (DTSS) in addition to Cal Poly Humboldt to deploy one Nortek Signature 1000 series Acoustic Doppler Current Profiler (ADCP) roughly 0.5 miles down current of the diffuser.
8. Water column profiles will be sampled using a Eureka Manta+35 water quality multiprobe at six stations: 100-300 ft down and up current of the diffuser, 800-1,000 ft down and up current of the diffuser, and at two reference sites roughly a mile down and up current of the diffuser. These stations will be sampled four times per year, twice between February and April and twice between July and September. Sampling events within seasons will occur no less than four weeks apart. The Manta+35 CTD measures depth, conductivity (salinity), temperature, pH, dissolved oxygen, and turbidity at two second intervals. Water column profiles will be conducted from the surface to approximately 3.3 ft above the seafloor. Conductivity, pH, turbidity, and dissolved oxygen probes will be calibrated no sooner than 24 hours before each sampling event using standard calibration solutions. Prior to every water column profile, the CTD will be lowered to the surface and allowed to acclimate to the current station. After three minutes, the CTD will descend at an approximate rate of 55 ft/minute until it is approximately 3.3 ft above the seafloor. The CTD will be

attached to a mini rosette water sampler which will collect water grab samples on its ascent.

Turbidity will be measured using an optical sensor probe within the Manta+35 according to the International Organization for Standards (ISO) 7027 standard, which measures the amount of light scattered by suspended particles at 90 degrees to a beam of infrared light. A Secchi disk will also be used to assess water clarity in addition to the Manta+35 measurement of turbidity. Secchi disk procedures will follow California Surface Water Ambient Monitoring Program (SWAMP) standard operating procedures. Secchi disk transparency depth will be measured at all CTD stations.

9. Harmful algal blooms (HABs) from taxa such as Pseudo-nitzschia spp., which produces the neurotoxin domoic acid, have become an increasing concern in Humboldt Bay. Humboldt Bay is located between Cape Mendocino, California and Cape Blanco, Oregon which have been described as “hot spots” for Pseudo-nitzschia spp. This area experiences significant upwelling in the spring which brings cool, nutrient rich waters from the deep to the surface that support primary productivity. This is followed by a relaxation period in the summer characterized by lower winds and warmer temperatures. Additionally, the bathymetric features of Cape Mendocino and Cape Blanco promote eddies that can trap HAB producing species. Therefore, HABs that might occur inside Humboldt Bay would likely be oceanic in origin and would be heavily dependent on tidal changes, temperature, and light levels within the Bay.

   Surface water samples will be collected at all water stations down current of the discharge outfall to determine presence of HAB cells and toxins during summer sampling efforts (July-September). Harmful algal bloom monitoring will include cell enumeration (cells/mL) and biovolume of potentially toxic genera. Brevatoxins, cyclic imines, domoic acid and saxitoxin concentrations will be assessed to determine the potential of HABs to form with the Permittee’s discharge.

10. The Permittee proposes to use environmental DNA (eDNA) as an alternative to a drop camera or remotely operated vehicle to collect information about the microbenthic and fish communities in the area of the outfall.

    The monitoring stations established in the Order are located in a highly dynamic area at the edge of the surf zone that regularly experiences unusual and unpredictable sea conditions as well as high turbidity. These unfavorable conditions are anticipated to result in very blurry and unusable benthic images or video footage. In 2022, H.T. Harvey & Associates conducted drop camera surveys near the RMT-II outfall and noted that turbidity seriously impeded their ability to accurately identify and quantify species in their images.

    Given the lack of visibility in previously performed biological surveys (Town of Samoa Wastewater Treatment Facility and DG Fairhaven Power Facility), Regional Water Board staff, in consultation with the California Coastal Commission, believe that eDNA sampling will provide more accurate information about what species are present near the outfall and reference sites, when compared with the lack of visibility from previous visual monitoring in the area.

11. A report will be submitted to the Regional Water Board following each sampling season to document results and from the oceanographic, sediment, water quality, HAB, and biological surveys. An annual report will also be submitted at the end of each year documenting intra-annual variability. The first two years of reporting will focus on baseline data prior Nordic's discharge. The third year of reporting will begin to represent conditions during discharge.

THEREFORE, BE IT RESOLVED THAT:

The Regional Water Board approves the Monitoring of Coastal Oceanography and Water Quality Work Plan and the Biological Survey , as required by Order No. R1-2023-0019 and attached hereto as Attachment 1. The Executive Officer may exercise their delegated authority to approve any subsequent non-substantive amendments to the Work Plan.

Certification:

I, Valerie M. Quinto, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, North Coast Region, on January 22, 2025.

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Valerie M. Quinto
Executive Officer