

2017 Cooke Aquaculture Pacific
WDOE NPDES Net Pen Permit Renewal Application Additional Information

3.7) Feed additives, disease control chemicals and medications that may be used at the net pen facilities include the following;

Feed Additives-

Canthaxanthin and/or Astaxanthin - Natural and/or synthetically produced compounds of the two types of carotenoid pigments may be added to the fish feed in levels ranging from 30 ppm to 70 ppm. Both canthaxanthin and astaxanthin are approved by the USFDA for use in fish feeds to enhance the pink to orange/red coloration of salmonid flesh. In the animal kingdom, carotenoids are heavily utilized as a source for pigmentation, a vitamin A precursor, for improving intercellular communication, enhancing immune responses, and as antioxidants in vivo [1, 2]. Salmonid fish species achieve physiological benefits from storing pigments in their tissues.

Antioxidants - Antioxidants are added to the fish feed mixture to stabilize the vitamin supplements and increase the shelf life of the feed. Antioxidants that are used in the fish feeds are Ethoxyquin (in the fish meal), BHA (in the fish oil), and Vitamin E.

Antibiotic Medicated Feed-

Medicated feed may be periodically used to treat bacterial disease at the marine net pen sites. The use of medicated feeds is infrequent and used only to treat specific disease events.

Romet 30 (Sulfadimethoxine-ormetoprim) - Romet 30 is the trade name for an aquatic animal premix containing a sulfadimethoxine-ormetoprim antibiotic that is used to treat bacterial disease. When medicated feed is prescribed, the premix is added by the feed manufacturer during the feed milling process. Romet 30 is used to treat Furunculosis, Vibrio, Myxobacterial and other bacterial pathogens if they occur in the cultivated fish stocks. When a disease treatment is prescribed by a veterinarian, the Romet 30 medicated feed is manufactured at a concentration of 2.27 grams of active ingredient per one (1) pound of fish feed. The medicated feed is then fed to the fish to achieve a dosage rate of 50mg of active ingredients per one (1) kilogram of fish per day, for a treatment period of five (5) consecutive days.

Terramycin TM 200 (Oxytetracycline HCL) – TM 200 is the trade name of for an aquatic animal antibiotic premix that is used to treat Furunculosis, Vibrio, Myxobacteria and other bacterial diseases. The TM 200 pre-mix is added to the feed by the manufacturer when prescribed by the veterinarian to treat specific disease events. TM 200 is mixed to achieve a concentration of 5 grams of active ingredient per one (1) pound of fish feed. The medicated feed treatment is fed to achieve a dosage rate of 75mg active ingredient per one (1) kilogram of fish per day, for a period of ten (10) consecutive days.

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Aquaflor- (Florfenicol) – Aquaflor is the trade name for the premix containing the antibiotic Florfenicol, and is approved by the USFDA for use in freshwater food fish to treat bacterial disease. In marine finfish aquaculture, Aquaflor can be used under the Investigational New Animal Drug (INAD) system administered by the USFWS and USFDA. When prescribed, Aquaflor medicated feed is used to treat bacterial disease and is mixed into the feed by the feed manufacturer at the active ingredient concentration rate of 0.302 grams per one (1) pound of fish feed. Aquaflor medicated feed is fed to the fish to achieve a dosage of 10 mg of active ingredients per one (1) kilogram of fish per day, for a period of ten (10) consecutive days.

Disease Control Chemicals- Other disease control chemicals that may be used at the farm sites are Finquel MS 222, Iodophor disinfectants and sodium hypochlorite (chlorine bleach) disinfectant solutions.

Finquel MS222 – Finquel (MS222) is a USFDA approved fish anesthetic that is periodically used when the fish are sampled for weight and condition factors. A small number of fish are periodically captured by dip net from a pen and then immersed in a tote of seawater with a small amount of MS222 mixed in. The MS 222 anesthetizes the fish so that they can be safely handled, inspected, weighed and then returned unharmed back to the fish pen. The fish quickly recover from the anesthetic when returned to ambient seawater.

Chlorine Bleach Solution and/or Argentyne Iodophor Solution – These surface disinfectants are used as a bio-security measure in footbaths at the farm sites and to periodically sterilize any shared equipment between the sites. Argentine Iodophor solutions are used in foot baths at the farm sites during the entire year. Estimated average annual consumption rates for each farming area of Iodophor solutions at the Bainbridge Island, Cypress Island, Hope Island and Port Angeles farm sites is approximately 55 gallons per facility. The use of sodium hypochlorite or chlorine bleach solutions at the net pen sites is infrequent.

3.8) Clean nets significantly reduce the drag loads exerted on the net pen structures and the netting materials themselves which in turn reduces the risks of tidal or storm damage causing a breach in the nets and fish escapement. Keeping nets clean also maintains a healthy growing environment for the fish by maintaining sufficient water flow through the net wall. Over the past several years, new netting materials have been developed by the industry that repels the accumulation of bio-fouling growth on the netting materials. The net pen industry has moved from using the older nylon blended net manufacturing materials to these newer polypropylene types of materials as they have been improved. The newer polypropylene net twines are tightly woven during the manufacturing process and have a hydrophobic property that helps to prevent the attachment of many bio-fouling organisms. This technological advancement has allowed the industry to reduce or completely eliminate the use of anti-foulant paint treatments on the netting material.

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Beginning in 2012, the Cooke Aquaculture marine net pen sites eliminated the use of the Flex-Guard anti-foulant treatment on all of their nets. Over the past five years, the company has replaced nearly 100% of their net inventory with these newer polypropylene nets. At the same time, the company switched to a single stocking production plan that allows ample time for the containment nets to be removed from the farms and transported to an upland net washing facility for complete cleaning and repairs.

Fish containment nets are typically pulled to the surface once per year and net changes can occur during the 14 to 18 month production cycle as needed. Cleaned fish containment nets can be rotated into service during the growing period to minimize the amount of marine fouling growth on the nets. During the growing period, nets can be rinsed in-situ with pressurized seawater as needed to minimize active bio-fouling growth. At the end of the production cycle as the fish are harvested out, the fish containment nets are pulled to the surface and transported to the upland support facility. The nets are then trucked to an approved upland net cleaning facility specifically designed for handling these nets. Materials washed from the nets are captured and disposed of properly at this washing facility. The cleaned and repaired nets are then shipped back to the farm for installation and in preparation for the next generation of fish to be stocked at the site.

3.9) The Cooke Aquaculture Pacific Spill Prevention Control and Response Plans (Attachment B) contain an updated list of chemicals and petroleum products that may be used at the site and the approximate quantity kept in inventory. Disease control chemicals that may be used at the facilities are briefly described below.

Iodophor solution and chlorine bleach. Disinfectant used in footbaths and to disinfect farm equipment. Small quantities are used through out the year.

Finquel MS222. A fish anesthetic used occasionally during size sampling of juvenile fish during the production cycle.

Medicated Fish Feeds-

Romet 30- Sulfadimethazine-ormetoprim. (Described in previous answer above)

Terramycin TM 200 (Oxytetracycline HCL) (Described in previous answer above)

Aquaflor- (Florfenicol) (Described in previous answer above)

3.10) Solid waste disposal practices for the facility include the handling and proper disposal and/or recycling of fish mortalities, sanitary waste and operational debris generated by the facilities. The Cooke Aquaculture Pacific- Pollution Prevention Plans (Attachment C) contain further detail on solid waste handling and pollution control plans.

Fish Mortalities- Fish mortalities are collected from each pen a minimum of three (3) times per week. The frequency of fish mortality collection is increased as needed, dependent on the experienced mortality levels at the farm sites. The fish mortalities

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(morts) are routinely collected by divers and brought to the surface in dive nets. The fish mortalities are put into large plastic fish totes which also have a single use, plastic tote liner placed inside of them. The tote liners are an additional barrier against leakage and also facilitate the cleaning and sanitation process after the contents are disposed of. The totes containing fish mortalities are frequently removed from the net pen sites and transported to the land based support facility where they are picked up and transported by truck to either a soil composting facility or a rendering facility. The fish totes are emptied at the receiving facility, the plastic liner is removed and disposed of, and the totes are steam rinsed and disinfected. Cleaned totes are then returned to their designated facilities for eventual reuse. The average monthly weight of fish mortalities removed from a site varies at different times of the year depending on what part of the growing cycle the fish population are in (new smolts or harvest size fish) and other factors that can increase the mortality rates such a harmful plankton bloom or disease event. Estimated average amounts of fish mortality biomass for a single generation of fish grown at the sites is given below.

Cypress Sites 1, 2 and 3-	Approx. 10,000 lbs. /month
Hope Island Site 4-	Approx. 3,000 lbs. /month
Port Angeles Site-	Approx. 6,000 lbs. /month
Bainbridge Island Sites-	Approx. 15,000 lbs. /month

Sanitary Waste and Operational Debris- The farm sites use chemical toilets (Port-a-Potties) for their employees and the proper disposal of sanitary wastes. The rented chemical toilets are routinely serviced by the company which provides them. Operational waste products generated by the net pen facilities are collected, stored in appropriate containment and then routinely transported to the shore side support facilities for appropriate disposal. Waste collection and recycling collection services are provided at the following land based support facilities:

- Port Angeles shore facility (Port Angeles net pens).
- Fort Ward dock facility (Fort Ward, Orchard Rocks, Clam Bay net pens).
- Anacortes dock facility (Cypress Is. Sites and Hope Is. Site).

The volume of solid refuse collected from each of these three locations is approximately 10 to 15 cubic yards per month.

Fish feed is transported to the site in large one (1) ton nylon bulk container bags. After the feed is removed from the nylon bags the bags are compiled and taken back to the land based support facility to be picked up for recycling.

Used oil and other hazardous materials are collected and transported to the associated upland support facility for eventual pickup and proper disposal by Emerald Services.

4) Environmental Monitoring

Site characterization and baseline studies were completed at the sites at the time of the original permitting process for the substantial development/shoreline conditional use permits/ Army Corps of Engineers Permits/ WDFW Hydraulic Permits/ and other related and necessary construction and operational permits. This application is for the renewal of existing NPDES permits for the company's marine net pen facilities. The original NPDES/Waste Discharge Permits for the facilities was issued in 1996. Cooke Aquaculture Pacific and the previous owners utilize the services of a third party consultant to conduct the required benthic monitoring and analysis. The required reports have been submitted to Ecology and WDNR as required by the conditions of the NPDES permits. Cooke Aquaculture Pacific can provide additional copies of specific past reports upon request.

Citations:

1. Goodwin TW: Metabolism, Nutrition, and Function of Carotenoids. Annu Rev Nutr. 1986, 6: 273-297.
2. Deming DM, Erdman JW: Mammalian carotenoid absorption and metabolism. Pure Appl Chem. 1999, 71: 2213-2225