2024 FACT SHEET FOR NPDES PERMIT WA0041114

Pacific Shellfish-Quilcene, LLC

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Pacific Shellfish – Quilcene, LLC. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for Pacific Shellfish-Quilcene, LLC, NPDES permit WA0041114, are available for public review and comment from insert month day, year until month day, year. For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement Information.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as Appendix E - Response to Comments and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

Pacific Shellfish-Quilcene, LLC, is a shellfish hatchery that produces oyster, clam, and mussel seed products. Since the 1950's, the site was used for shellfish farming but has since transitioned to a hatchery-only operation. The Coast Seafoods Company owned and operated this facility until 2011 when Dulcich, Inc. dba Pacific Seafood Group purchased the hatchery now identified as Pacific Shellfish-Quilcene, LLC, a wholly owned subsidiary.

This permit is the first NPDES permit for the facility after a court decision in 2018 determined the hatchery discharged in a manner that required authorization in accordance with the Clean Water Act. Throughout December of 2022 and January of 2023, Ecology provided a public comment period on the first version of this draft permit, which was not issued. During the comment period, Pacific Shellfish proposed major wastestream consolidation that would eliminate eleven outfalls and create two new outfalls with different effluent characteristics. As a result, Ecology wrote a 2nd version of the draft permit.

The 2nd version of the permit establishes technology-based limit for pH and water quality-based limits for total residual chlorine and temperature in effluent for the two outfalls discharging process water. The permit contains a compliance schedule that sets milestones for receiving waterbody studies for temperature and turbidity, and lab accreditation for compliance monitoring of total residual chlorine. The compliance schedule also requires tank cleaning residual wastewater characterization and the evaluation of alternatives for the treatment of removed solids in the tank cleaning wastestream and the media filter backwash.

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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the Waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to industrial NPDES permits:

Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)

Water quality criteria for surface waters (chapter 173-201A WAC)

Water quality criteria for ground waters (chapter 173-200 WAC)

Whole effluent toxicity testing and limits (chapter 173-205 WAC)

Sediment management standards (chapter 173-204 WAC)

Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC)

These rules require any industrial facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See Appendix A-Public Involvement Information for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in Appendix F.

II. Background information

Table 1 - Facility information

Applicant:	
Applicant (Owner and Permittee)	Dulcich, Inc. dba Pacific Seafood Group 16797 SE 130th Ave (PO Box 97) Clackamas OR 97015-0097
Facility Name and Address	Pacific Shellfish – Quilcene, LLC 1601 Linger Longer Road (PO Box 327) Quilcene WA 98376-0327
Legal Responsible Party	Name: Dan Occhipinti Title: Chief Legal and Administrative Officer Phone: (503) 905-4446 Email: DOcchipinti@PacificSeafood.com
Facility Contact #1	Name: Miranda Ries Title: Director of Regulatory Affairs Phone: (360) 951-7334 Email: Mries@ PacificSeafood.com
Facility Contact #2	Name: Svein Wiese-Hansen Title: General Manager, Aquaculture Phone: (503) 812-1150 Email: Swiese-hansen@PacificSeafood.com
Industry Type	Shellfish hatching and rearing larvae through seed
Categorical Industry	Not applicable
Type of Treatment	Dechlorination/neutralization of tank cleaning residual wastestream
Fee Category	Non-finfish hatching and rearing - Individual Permit
SIC Code	0273 Animal Aquaculture
NAIC Code	112512 Shellfish Farming and Shellfish Hatcheries
Facility Location (Latitude, Longitude in NAD83/WGS84 reference datum)	47.802526, -122.868616
Discharge waterbody name and location (NAD83/WGS84 reference datum)	Outfall 001, Quilcene Bay North, 47.802712, -122.867729 Outfall 002, Quilcene Bay South, 47.802162, -122.867376
Intake Structures (location of withdrawal)	Subtidal Marine Wells: W01 - Algae Dept.: 47.802142, -122.866950 W02- Larvae Dept.: 47.802150, -122.866831 W03 - Larvae Dept.: 47.802133, -122.867011 Bay Water: B01 (shallow): 47.802167, -122.864817 B02 (deep): 47.802217, -122.865367

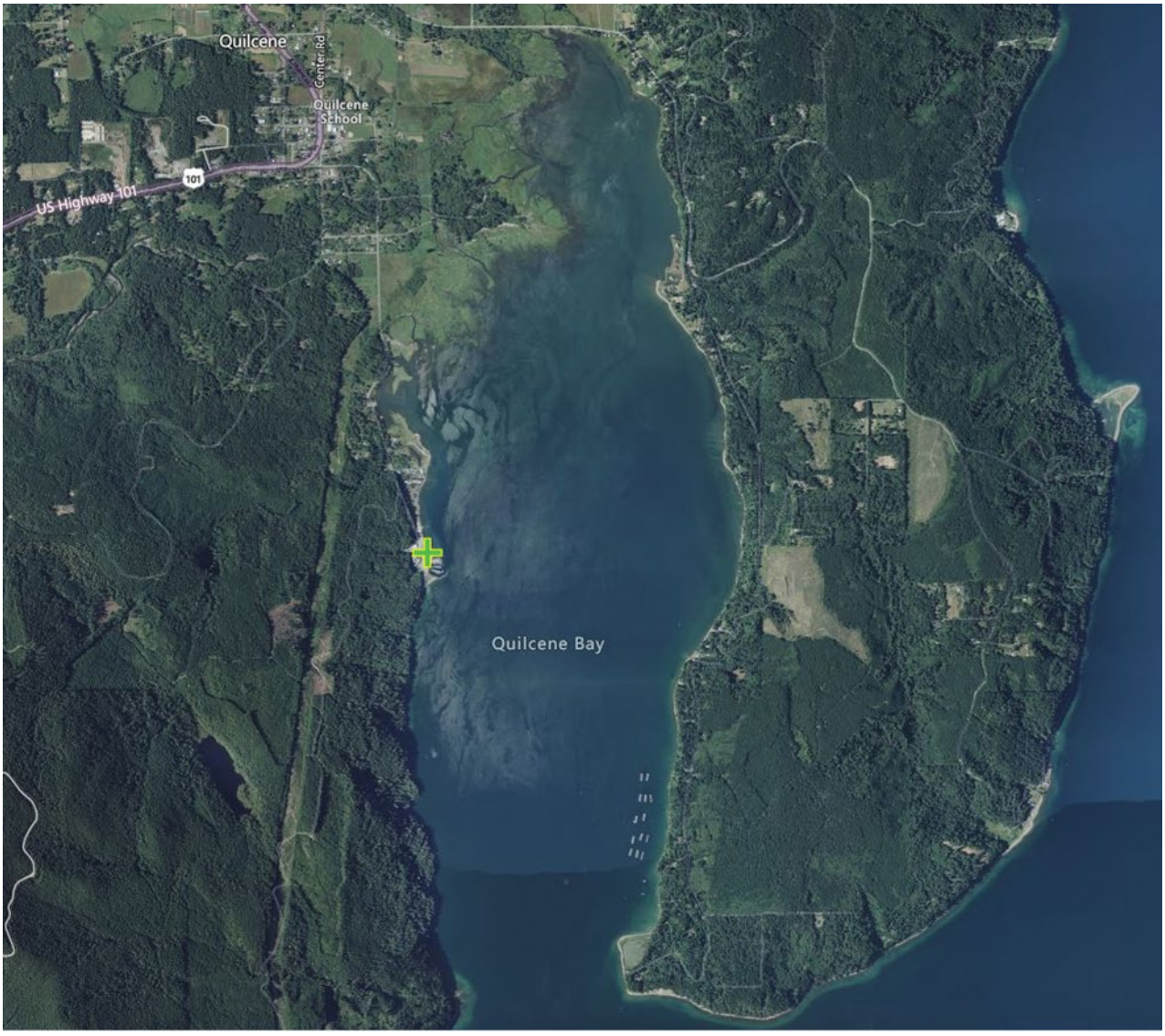
Permit status

Application for Permit - Receipt Dates	December 3, 2018 June 4, 2019 June 22, 2021
Date of Ecology Acceptance of Application	September 22, 2021
First Draft Permit (major milestones): Entity review: Public comment period: Decision to draft a second permit:	 August 18 - September 21*, 2022 (*deadline extended from September 5, 2022) December 14, 2022 - January 27*, 2023 (*deadline extended from January 4, 2023) March 6, 2023
Second Draft Permit 90% Design Plans and Water Flow Diagram: Entity Review:	 December 1, 2023 and December 22, 2023 February 13 – 28, 2024

Inspection status

Dates of Last Non-sampling Inspection Date: September 23, 2019 and August 15, 2023

Figure 1 - Facility location map



II.A. Facility description

Pacific Shellfish – Quilcene, LLC, is a shellfish hatchery (the Hatchery) that hatches and cultures oysters primarily but also clams and mussels, creating products called shellfish seed. This seed is either distributed to company owned sites or sold to entities that continue to grow the shellfish on marine tidelands or from rafts until they reach harvestable sizes for commercial sale (i.e., shellfish farming). The hatchery is in Jefferson County just south of Quilcene, Washington on the western side of Quilcene Bay, adjacent to the Herb Beck marina. The Pacific Seafood Group owns the hatchery building property and shoreline down to the mean lower low water (MLLW) line while leasing the remaining property from the Port of Port Townsend.

1. History

Coast Seafoods Company owned and operated this facility until 2011 when Pacific Shellfish, a subsidiary of Dulcich, Inc. dba Pacific Seafood Group, purchased the hatchery. Beginning in the 1950's, the site operated as a shellfish farm. In 1978, the hatching and culturing of larval shellfish to produce seed began (i.e., operating as a shellfish hatchery). In 2000, shellfish farming ceased, and the facility has since operated solely as a shellfish hatchery.

In 2016, the Olympic Forest Coalition filed a citizen suit under § 505 of the Clean Water Act alleging that discharges from the shellfish hatchery through pipes, ditches, and channels violate § 301(a) of the Act because the hatchery had not obtained a NPDES permit. The complaint asserted that a 2013 effluent study documented several pollutants and later water sampling indicated chlorine was present in the discharges.

Ecology's position leading up to the U.S. Court of Appeals decision in 2018 was the hatchery did not meet EPA's Concentrated Aquatic Animal Production Facility definition as a point source (40 C.F.R. § 122.24; 40 C.F.R. pt. 122, App. C) and as a result did not require an NPDES permit to authorize the discharges. Furthermore, Ecology reviewed the permittee's 2013 effluent study by Rensel Associates and determined that Quilcene Bay water quality was unlikely to be altered.

In March 2018, the U.S. Court of Appeals for the Ninth Circuit held in Olympic Forest Coalition v. Coast Seafoods Co., 884 F.3d 901, that pipes, ditches, and channels that discharge pollutants, specifically chlorine, from non-concentrated aquatic animal production facilities are point sources within the meaning of the Clean Water Act (CWA 33 U.S.C. § 1362(14)).

In November 2018, the Permittee submitted their first permit application package. Ecology met with the Permittee in the spring of 2019 to discuss what shellfish hatchery operations entail, the application materials and the necessity of an engineering report that meets WAC 173-240-130(2) requirements. Ecology received a draft engineering report in June 2019. While this first draft engineering report lacked sufficient information to characterize all the processes and discharges, the report was the first for this industry and laid the groundwork for Ecology, the Permittee, and the engineering consultant, SLR International, to determine how best to proceed next. In the fall of 2019, Ecology performed a joint site visit to observe and review the hatchery processes, seawater intakes, and wastewater discharges. Afterwards, Ecology provided technical assistance regarding site improvements and next steps to submit a more complete engineering report. The goal for the final engineering report was to provide source water and wastewater characterization that included all the processes, such as pumping and preconditioning the source water and identifying added constituents to the wastewater to begin writing a permit.

After Ecology visited the site in the fall of 2019 and supplied technical assistance, Pacific Shellfish worked to consolidate 24 outfalls to four that discharged to Quilcene Bay and seven that discharged to an underground, unnamed creek, according to the final engineering report. Then, Ecology approved a sampling and analysis plan for wastewater characterization, water balance and hydrogeologic connectivity in late summer of 2020. The permittee submitted the results in an updated draft engineering report and application package in spring and summer of 2021, respectively. Ecology accepted the final application package that contained an engineering report with sufficient information of the source water and the discharges to begin drafting a permit in September 2021. The first draft permit was publicly noticed in November 2022 but after the close of public comment at the end of January 2023, Pacific Shellfish requested that they be allowed to upgrade the facility to consolidate outfalls further, removing all discharges to the creek and creating two outfalls discharging to Quilcene Bay. *After reviewing the initial design plans for consolidation into two outfalls, in March 2023 Ecology agreed to write this second draft permit and thereby incorporate the changed flows, discharge locations, and effluent characteristics.*

2. Industrial processes

The Hatchery operates yearlong, 24 hours, 7 days a week and employs approximately 30 staff. Staffing varies seasonally. Production slows during the winter. The Permittee reports the discharge volumes and constituents vary little seasonally. The operation uses a collection of broodstock, which are the stock of shellfish held on site to spawn for larvae production. Hatchery staff maintain the broodstock, larvae, cultch, and single seed cultures in a variety of tanks. The seawater is either changed out in a static renewal or flow-through process with new seawater pumped from a combination of subtidal wells and Quilcene Bay. The permittee cultures algae on site and feeds a volume of concentrated algae in batches to each tank of shellfish. The staff regularly cleans the tanks to maintain algae and shellfish health and promote consistent production levels.

As reported by the Permittee, Figure 2 - Site plan, depicts buildings and tank areas colored to represent the department it supports. The Algae Department (Green) consists of operations involving culturing algae to feed the shellfish. The Larvae Department (Pink) is all the operations to maintain the broodstock, hatch and grow the shellfish larvae to the pediveliger stage. The Setting Department (Blue) is all the operations to grow the oyster cultch and single seed products.

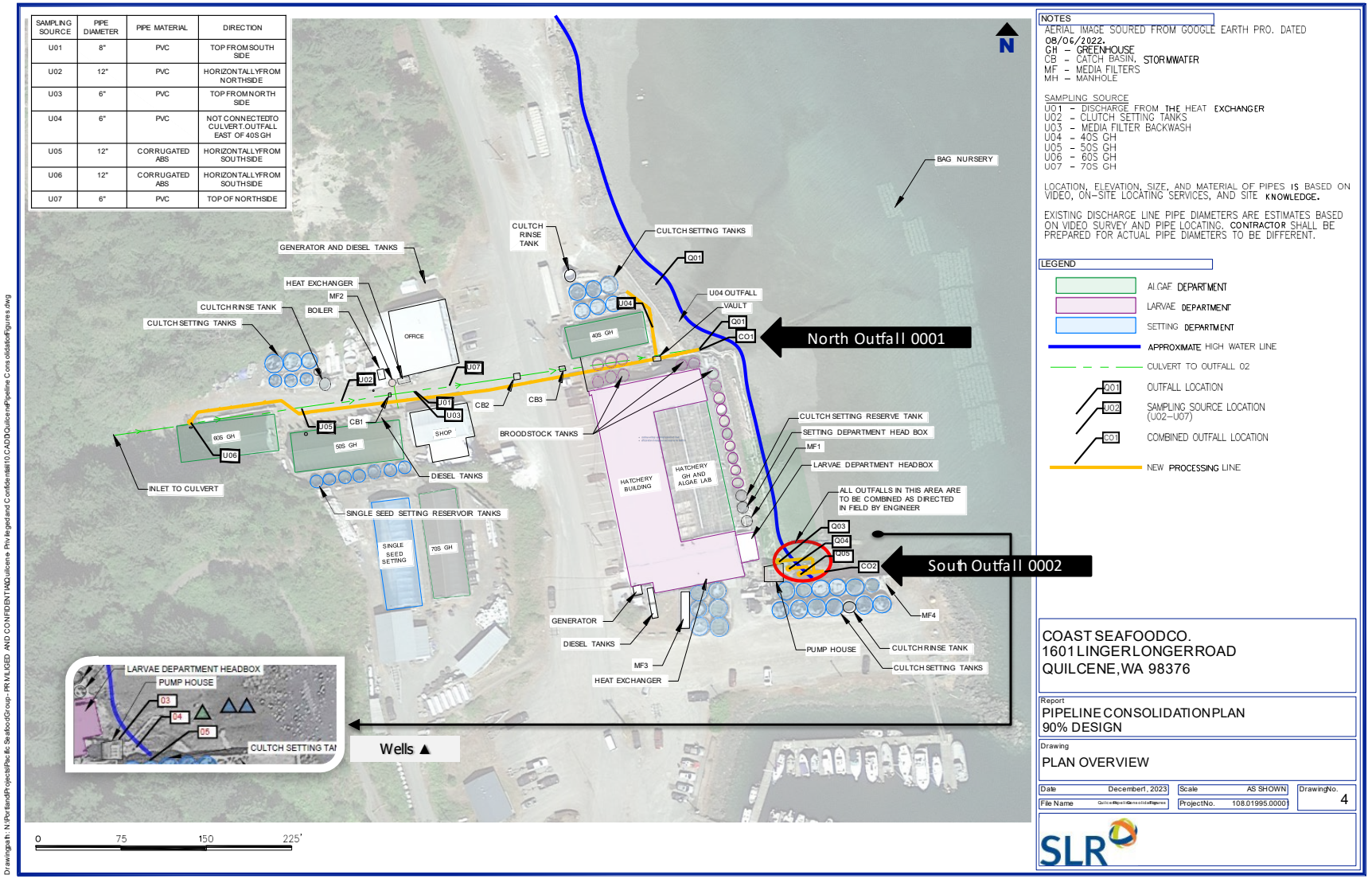


Figure 2 - Site plan

Growing the algae: Marine well water is used to grow large volumes of a concentrated multi-species algae mix (approximately 100,000 gallons per day) in a complex of greenhouses on site. The algae cultures are started in the lab, grown in bags and then in tanks of increasing size until the algae mixture is of sufficient volume and concentration to feed out to the shellfish. Prior to inoculation, heated seawater is disinfected using non-chlorination methods to remove pathogens.

Growing the shellfish: The concentrated algae mix is pumped out to broodstock, larvae, cultch, and single seed held in a variety of tanks, in regular batches to sustain optimal growth. The shellfish filter-feed the algae, removing the algae from the water column until more algae needs to be added. The water that larvae, cultch, and single seed are maintained in is filtered and heated. Products are grown to various stages (Figure 3). The Hatchery sells oyster and the other shellfish larvae at the pediveliger stage. The hatchery also grows oyster spat that settle to grow on shell substrate called single seed or cultch until sold.

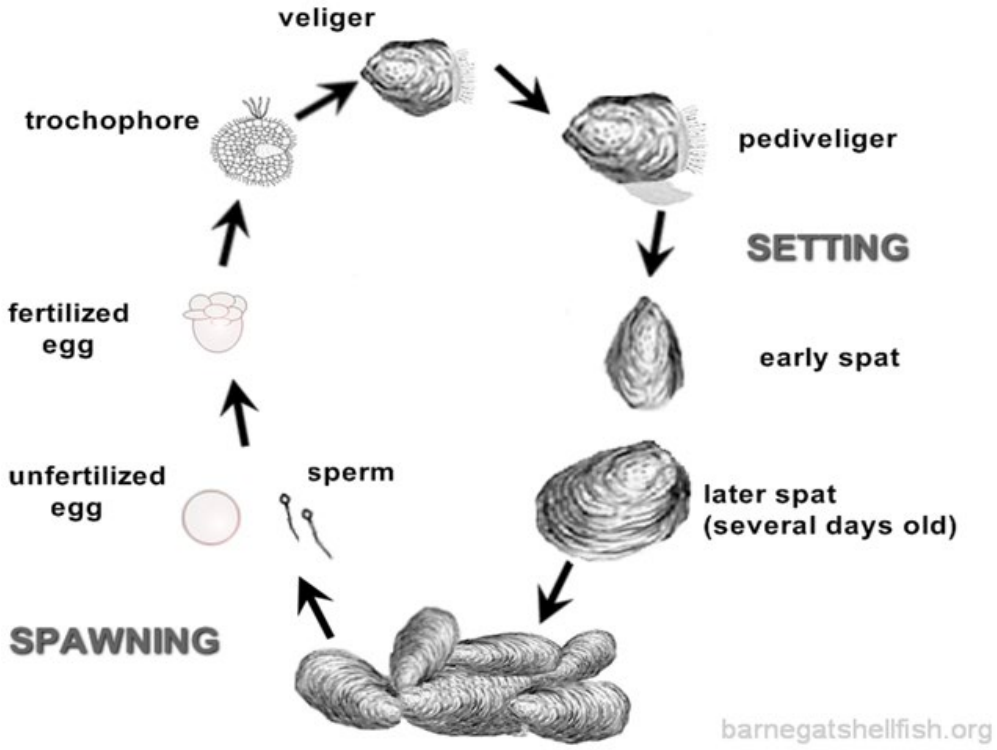


Photo credit: Auburn University, Marine Extension and Research Center

Figure 3 - Oyster growth cycle and stages

The products: The Hatchery produces primarily oysters but also clams and mussels, creating products called shellfish seed. The Permittee either distributes the seed to company owned sites (i.e., nurseries) or sells the seed to entities that continue to grow the shellfish on marine tidelands or from rafts until they reach harvestable sizes for commercial sale.

The Hatchery produces three types of finished products. They include:

- Larvae sold in batches, which are placed in a coffee filter, sealed in a plastic bag, and shipped by FedEx to the customer.
- Cultch bags sold by the bag with each containing approximately 230 to 250 half shells with shellfish larvae attached. The cultch bags are loaded onto trucks then trucked to their location.
- Single seed oysters sold in increments of one thousand or sent to Pacific's own nurseries.

The Hatchery produces several shellfish species (oysters, clams, and mussels) with a combined annual production of nearly 30 billion individual shellfish larvae.

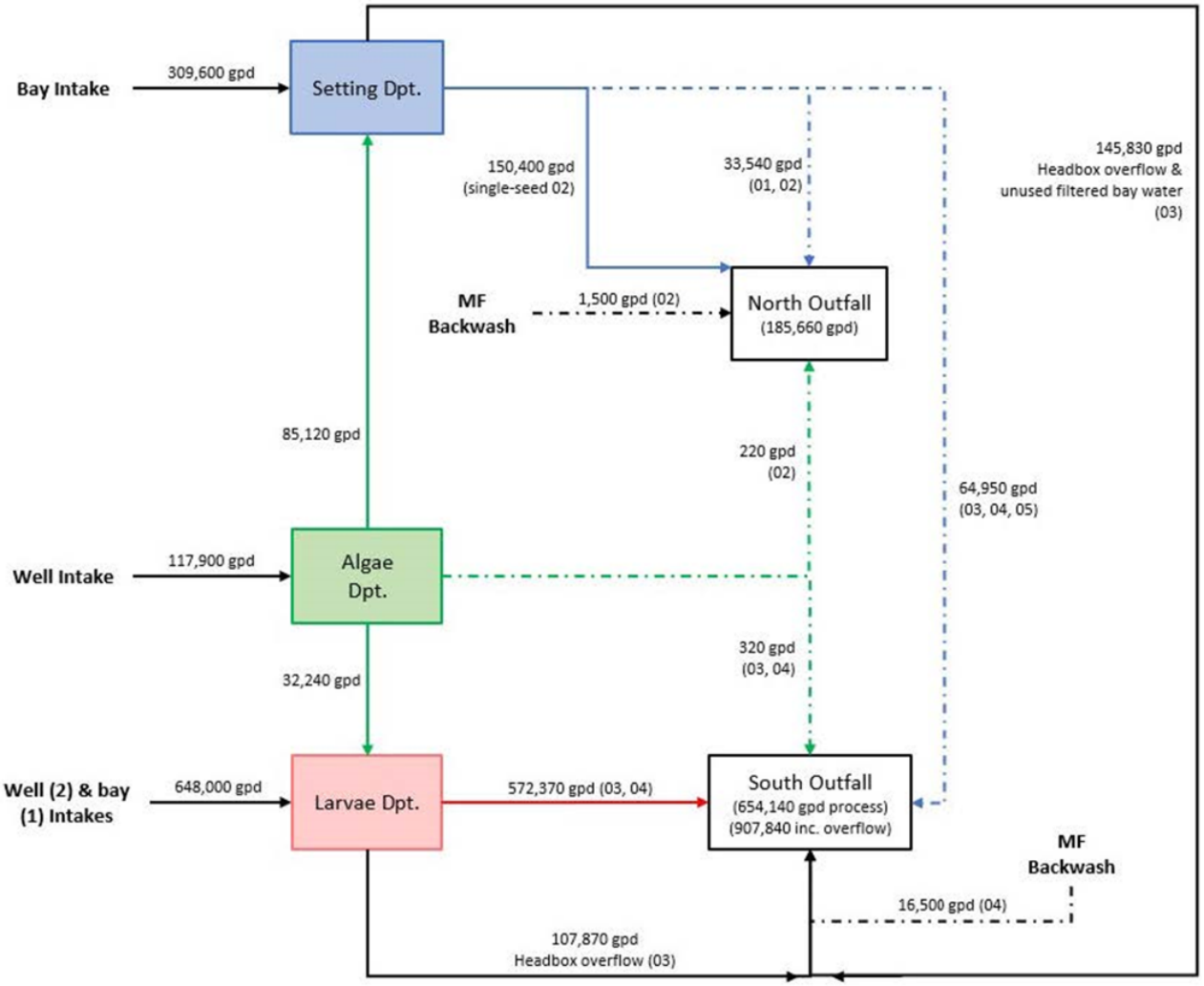
3. Cooling water intakes

CWA § 316(b) requires the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Since July 2013, Ecology has required a supplemental application for all applicants using EPA Form 2-C. Pacific Shellfish – Quilcene, LLC selected "Yes" on this form when asked if a cooling water intake is associated with the facility and answered the supplemental questions.

The hatchery takes in 1.224 million gallons per day and only uses 21% of this intake for cooling. CWA §316(b) requirements apply to all industrial NPDES permitted facilities with cooling water intake structures. EPA has promulgated best technology available (BTA) effluent guidelines for facilities meeting certain thresholds: This facility is below the thresholds requiring the facility to meet best technology available. However, an existing facility will be evaluated with Ecology's best professional judgment as per 40 CFR 125.90(b). Ecology has proposed in the permit a special condition that the Permittee must conduct an inspection of their intakes, determine the presence and type of screens, install screens if determined they are not present, and provide engineering drawings (i.e., as-built drawings) of all intakes.

4. Wastewater treatment processes

Figure 2 - Site plan is Pacific Shellfish's Plan Overview at the 90% design phase submitted to Ecology in December 2023. The inset features the marine wells that were noted in the design plan from the final engineering report prepared by SLR (Feb 2021). Also submitted with the 90% plans was the water flow diagram (Figure 4) to reflect the consolidation of outfalls and the changed flow regime.



Departments and flows associated with the Algae, Larvae, and Setting departments are shown in green, red, and blue, respectively. Flows such as backwash or overflows of unused water that have not come into contact with algae or animals are shown in black. Solid lines represent continuous flows. Dashed lines represent intermittent flows. On the flow lines, the numbers in parentheses represent the outfalls, 01 through 05, to which the flow discharged to prior to consolidating Outfalls 01 and 02 into the North Outfall and Outfalls 03, 04, and 05 into the South Outfall.

Figure 4 - Water flow diagram

In the 2021 engineering report, the Permittee states they do not employ treatment for added constituents or other parameters of concern in their wastestreams and effluent. While the 2019 draft engineering report outlines other permits for shellfish hatcheries to manage parameters of concern, the Permittee has not performed an analysis of all known, available, and reasonable treatment technology or source control (i.e., AKART evaluation) for the limitation of the specific parameters of concern at this site as they relate to the different types of wastewater discharges.

The Permittee employs a neutralization step after the use of hypochlorite (bleach) in its tank cleaning process. This is a form of treatment applied to the wastestream for tank cleaning residuals to prevent the discharge of total residual chlorine. The neutralization of the bleach is a best management practice. The proposed permit implements this as a required best management practice and required standardized procedures for reporting with additional accredited testing process to assure field testing meets precision and accuracy requirements.

Prior to the 2023 outfall consolidation efforts, wastewater discharges were defined as either segregated or process water. Segregated discharges, which consisted of tank cleaning, tank draining, and media filter discharges, no longer occur directly to the receiving water bodies. Tank cleaning, tank drainage, and media filter discharges are connected to the process water wastestreams that in combination discharge from two outfalls directly to Quilcene Bay.

Process Water Effluent: Process water effluent consists of continuously flowing return flow and/or flow-through water and episodic mixing of previously mentioned wastestreams. Continuously flowing water can be two types. One is return flow from headbox overflow and unused filtered seawater, without exposure to animals. Second is flow-through outflow from holding tanks that maintain broodstock, larval shellfish, single seed and cultch. Tank cleaning, tank drainage and media filter wastestreams mix into these two types of continuously flowing seawater creating process water effluent. A distinction is process water effluent is large volumes of continuously flowing return flow or flow-through water mixing with vastly smaller volumes of wastestreams prior to discharging to the receiving waterbody.

Water intake and uses:
The Hatchery pumps raw seawater water into the facility in combination from two bay intakes and three seawater wells, located in the subtidal zone, depending on the use or department. Figure 4, the water flow diagram, depicts the distribution by department. Depending on use, heat exchangers warm the influent to the required temperatures and media filters are used to remove particles.

Bay water intakes: Two pipelines run from each intake location, i.e., there are four pipelines in total, two pipelines per intake. The intake pipelines are 10 inches in diameter, and the intakes are located in the Bay at an approximate depth of 52

feet below mean lower low water (MLLW). At the Hatchery, the two pipelines for each intake connect and merge into one pipeline (i.e., one pipeline per intake). The map below (Figure 5) indicates in green the location of the bay intake pipe.

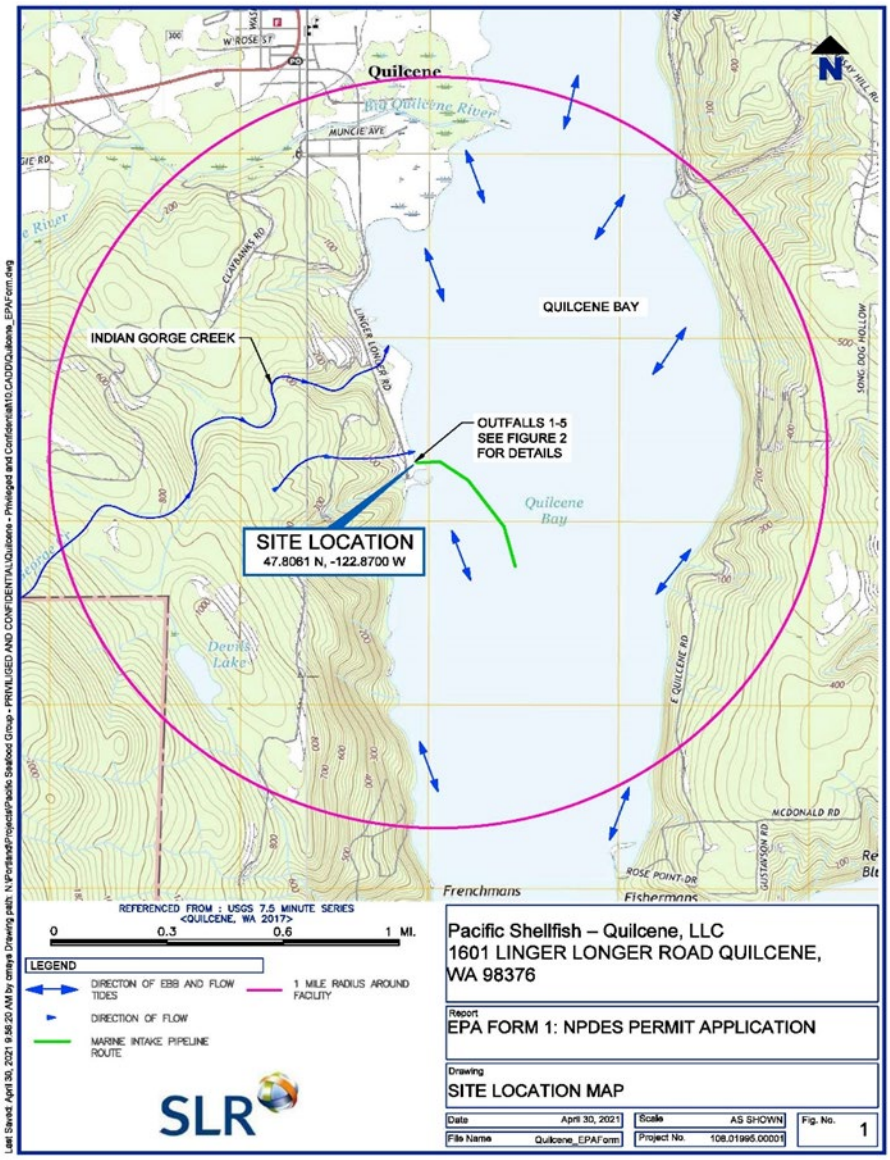


Figure 5 - Bay water intake map

Subtidal well water intakes: The hatchery uses three seawater wells. The wells are in the subtidal zone in front of the hatchery building, adjacent to the bulkhead. The three wells are positioned such that the tops are submerged by seawater except during low tide. Each can be located on Figure 2 of the site plan. Using the Washington State Well Report Viewer (https://appswr.ecology.wa.gov/WellConstruction/Map/WCLSWebMap/default.aspx), two well reports can be found for this facility. One well drilled in 1990 is 60 feet deep, and another drilled in 2010 is 32 feet deep. The reports indicate

industrial use with static water level at sea level. The drilling log for the well drilled in 1990 was identified as a “salt water well”. The screened interval is from 20 to 60 feet below ground surface. Strata are described as water bearing (W.B.) sand and gravel for the entire 0 to 60 feet interval. The 2010 well was built with a slot screen from 6 to 32 feet and a sump at 34 feet.

Seawater use: Figure 6 below describes the quantity of water used in the Algae (green), Larvae (pink) and Setting (blue) Departments. Water pumped for use in the Larvae and Setting Departments is pumped in excess so to keep a pressurized head. The excess is overflow or filtered but returned without added constituents and discharged through outfalls mixing with process water and wastestreams. Noted in gray below is the volume and proportion of returned seawater as either headbox overflow or unused filtered bay water. Only well water is used in the Algae Department and there is no overflow or unused water discharges.

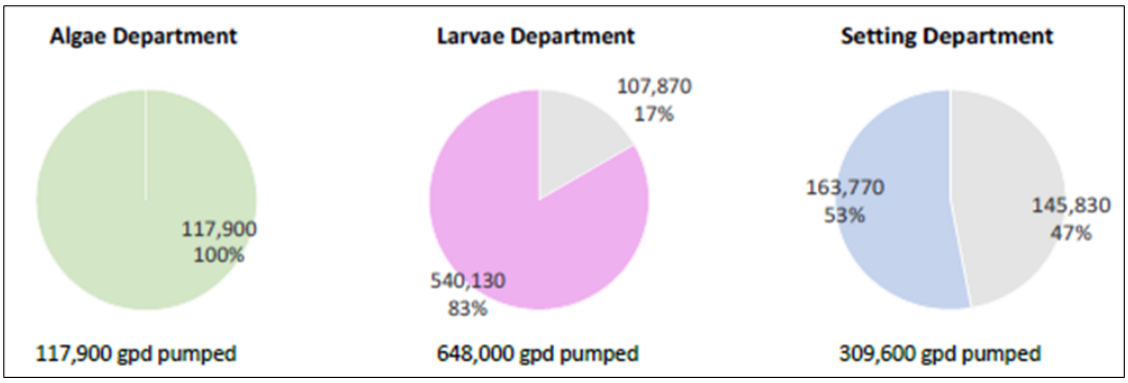


Figure 6 - Department water use

Wastestreams and parameters of concern

Tank Cleaning Residuals: Tank cleaning produces cleaning waste residuals that are a result of the physical cleaning, disinfection, and neutralization of tank surfaces after a shellfish or algae growing cycle is complete. Sodium hypochlorite (i.e., bleach) is used to clean tanks in both the Setting and Larvae Departments as well as the tanks for growing algae. Currently, the cleaning residual is tested using a low range (0.02 mg/L) free chlorine colorimetric DPD test kit for field use (https://www.hach.com/free-chlorine-test-kit-model-cn-70f/product?id=7640219517) to test and affirm the absence of free residual chlorine prior to discharging. The Permittee reported the following procedures:

- For cultch setting, algae, and larvae tanks, once emptied, a solution containing approximately 20 milliliters (mL) of 12.5% bleach in 5 liters of water is used to wash down tank interior surfaces (0.05% bleach solution). Tank cleaning is done by hand using a long-handled scrubber with an abrasive pad. The cleaning process results in approximately 10 gallons of cleaning

solution and rinse water residuals in the bottom of the tank. The bleach in the cleaning residual is neutralized using sodium thiosulfate prior to discharge. Sodium thiosulfate in the efflorescent crystalline form is mixed into an aqueous working solution by adding 1,506 grams to 15 liters of water. A portion of this solution is poured into the cleaning solution residuals in the bottom of each tank and is mixed. The water is then tested using the colorimetric DPD field test for residual chlorine. No water is discharged until the beach has been successfully neutralized.

- In the single-seed setting system, cleaning entails draining the setting boxes, scrubbing the walls with an abrasive pad, refilling the boxes with salt water, adding approximately 0.75 quart of 12.5% bleach, and recirculating it through the system for a period of time. The bleach is neutralized by adding a comparable amount of 3% hydrogen peroxide to the recirculation water. The water is tested for residual chlorine and no discharge occurs until the beach has been successfully neutralized.

Tank Drainage: Tank drainage occurs in preparation for feeding algae to the shellfish or after a growing cycle is complete. This wastestream discharge consists of draining some or all the water in a tank that housed living shellfish. Tank drainage is the activity where a whole tank is emptied, or a portion of water is drained to either clean or feed. Parameters of concern in tank drainage are temperature and turbidity (see Wastewater Characterization tables).

Media Filter Backwash: There are 26 total media filters that operate to filter intake water of the suspended solids. There are 14 media filters in grouping MF1 on the east side of the main hatchery building, eight in MF2 on the south side of the hatchery building, two in MF3 on the upland side of the road near the office, and two in MF4 on the end of the bulkhead. The filter groupings are located in four areas of the Hatchery. Based on the entity review follow-up letter dated October 24, 2022, as of August 2022, media filter group 4 was decommissioned. The filters are backwashed regularly to keep running optimally, which creates a discharge of the removed solids. Filter backwash consists of the removed solids from intake source water, which contains concentrated natural organisms and suspended sediment.

Process Water: Source water flows in through heat exchangers; however, the primary function of the heat exchange involves heating the source water for the growing of algae and shellfish. The secondary, indirect result is some heat load reduction in the process water that is discharged after flowing out of the heat exchanger. However, heat exchange is not directly used for treatment to reduce heat load of the process water discharges.

Other

The Algae Department uses muriatic acid (i.e., hydrochloric acid or HCl) and isopropyl alcohol to clean equipment and surfaces in their various greenhouses and lab locations. Small quantities of muriatic acid are occasionally disposed in the process of cleaning and enters the effluent from the Algae Department mixed with process water. The primary algae lab sink is connected to the Port of Port Townsend septic system (M. Reis personal communication August 15, 2023).

Marine water used to grow a mixture of algae species is not directly discharged as a wastestream but is held, pretreated, and inoculated. The algae are cultured using a mixture of macro- and micronutrients to optimize growth. The algae grow up through a series of increasingly larger rearing vessels until eventually fed out to shellfish in tanks where a portion of water has been drained (i.e., tank drainage wastestream.

5. Solid wastes

There is currently no sludge produced from hatchery operations. All trash, operational debris, and used materials, including discarded algae bags, are hauled off-site through Murrey's Olympic Disposal services.

6. Discharge outfall

The hatchery effluent discharges out two outfalls. Each outfall pipe is embedded in the rip rap along the shoreline and the pipe daylights immediately above the subtidal zone where the effluent will spill over the rocks until the discharge meets the bay water. At this point in time, the outfalls are not submerged nor is there a diffuser connected. Figure 2 - Site plan shows the planned location of the newly combined outfalls (North Outfall 001 and South Outfall 002) relative to the receiving waterbody, Quilcene Bay. Figure 4 - Water flow diagram, describes the various process and wastestreams that are directed to flow out each outfall.

II.B. Description of the receiving water

1. Receiving waterbody

The Hatchery discharges to Quilcene Bay, which is marine waters. After the 2023 pipeline consolidation, no wastestream discharges to the un-named creek located under the upper hatchery area. Section IIID describes the designated uses and surface water criteria. There are no other point sources that discharge to Quilcene Bay. The nonpoint sources of pollution include upland forestry practices, malfunctioning septic systems, and livestock agriculture. Section IIIE of this fact sheet describes any receiving waterbody impairments.

Quilcene Bay is a marine waterbody located on the northwestern side of Hood Canal in Jefferson County, Washington (see Figure 1– Facility Location Map). Quilcene Bay is a popular area for recreation that includes boating, fishing, and swimming (Swim float to return this summer at Quilcene beach | Port Townsend Leader (ptleader.com)). The Herb Beck Marina, operated by the Port of Port

Townsend, is located just next to the Hatchery on its southern side. Pacific Shellfish runs an oyster nursery in the nearshore area in front of the hatchery.

The shallow areas of the bay in the northern half contain eelgrass and other seagrasses (DNR Puget Sound Eelgrass Monitoring map accessed 12/1/2023 Quilcene Bay eelgrass map). The bay supports a Coho salmon fishery in the fall based on the U.S. Fish and Wildlife Service Hatchery operation on the Big Quilcene River in accordance Hood Canal Salmon Management Plan, which releases 400,000 Coho salmon smolts every year. As recently as 2020, WDFW has reported increasing local herring abundance (i.e., the Quilcene stock) as measured during spring spawning and this stock has experienced the majority of the herring population increases in Puget Sound (PSP Vital Sign, WDFW Forage Fish Unit reporting).

Quilcene Bay is a shallow, dynamic waterbody with a volume of approximately 40,000 million gallons of marine water at MLLW. Nearly half the bay is less than five meters (16.4 feet) deep with the maximum depth near the head of the bay at 50 meters deep (164 feet) near Fisherman's Point. Bay (see Bathymetric Data Viewer (noaa.gov) accessed 2/8/2022) The Big Quilcene River contributes the most freshwater to the bay with an average of 93 million gallons a day (MGD) based on data from 1995 through 2021 at USGS gage number 12052210. It enters the bay at the northwest corner. The hatchery discharges occur at the riprap on the shoreline near the middle part of the bay on the west side, 1.3 miles south of the river's mouth.

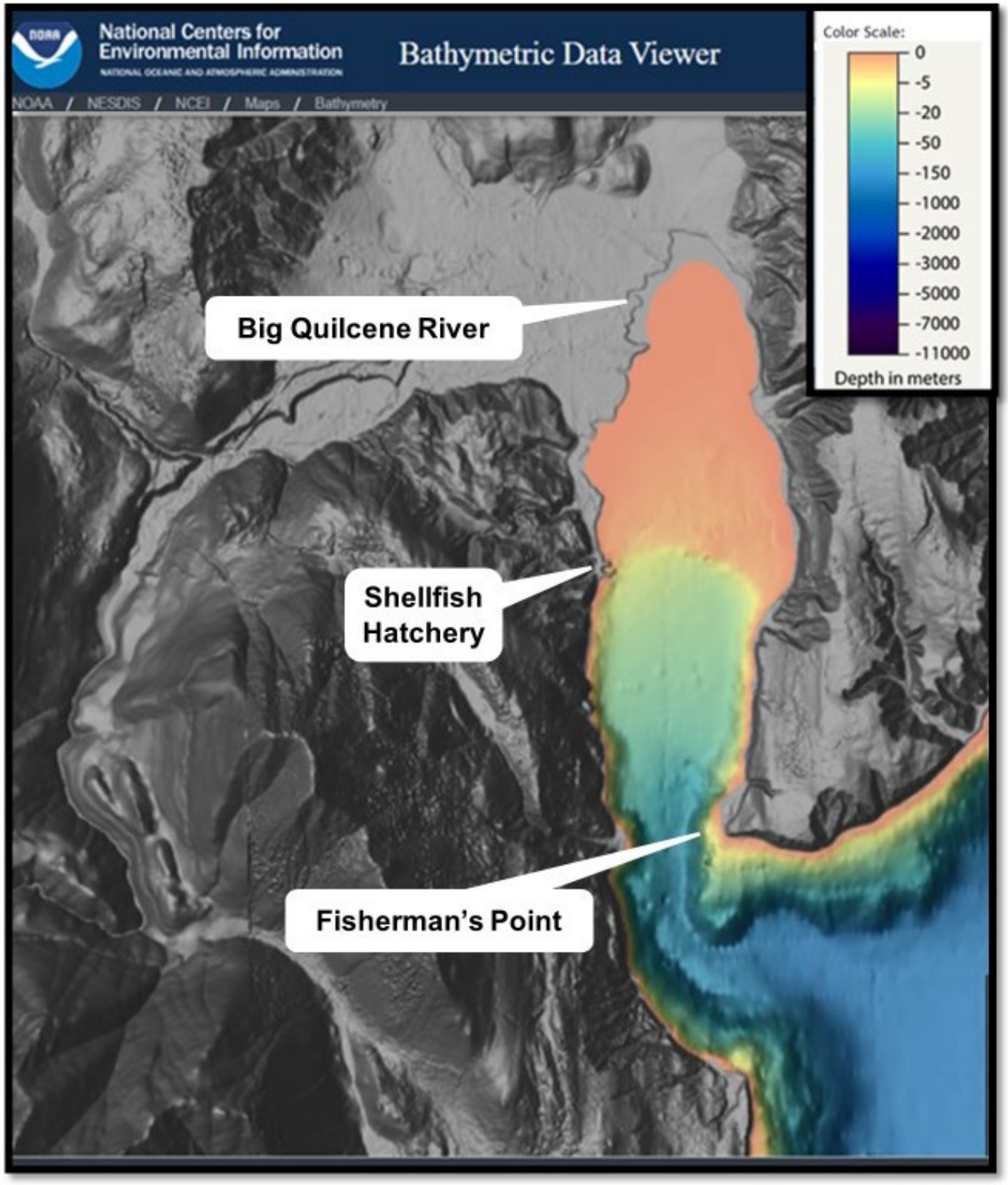


Figure 7 - NOAA bathymetry map of Quilcene Bay

2. Source water and ambient conditions

The Hatchery takes in seawater from Quilcene Bay and subtidal marine wells located directly in front of the hatchery in various combinations for growing algae, growing larval shellfish, maintaining broodstock and setting oyster larvae. The Permittee characterized and reported on the two types of intake water in their final engineering report (SLR 2021).

The primary concern for the Hatchery relative to ambient conditions is temperature and heat load in the discharges. Figure 8 is a graph from the final engineering report (SLR 2021) indicating the one-day maximum temperature (1DMax) recorded every five minutes at five feet and ten feet below the surface at a location just over a half mile north of Fisherman's Point from August through October 2020. The monitoring location was across the bay away from the hatchery and represents background conditions without influence of the hatchery discharges. The water quality standard for aquatic life uses for temperature in Quilcene Bay is Extraordinary (13°C); however, the graph indicates the aquatic life use categories for all temperature standards relative to the 1-DMax data.

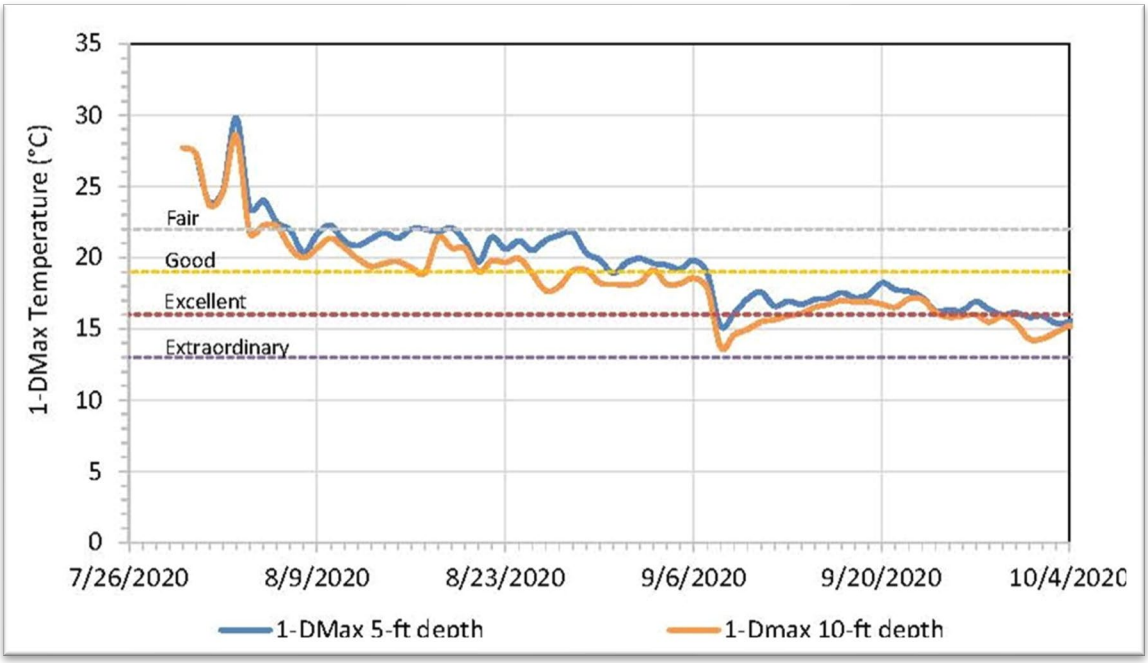


Figure 8 - Daily maximum temperatures in 2020 north of Fisherman's Point

Hydrogeologic Study of Marine Water Wells: Section 4 of the engineering report (SLR 2021) presented hydrogeologic connectivity study results. Well data demonstrated that pumping flow rate varies with tide. The paired samples collected characterized the water chemistry of well water and bay water. A preliminary analysis of the water chemistry data suggests well water and bay water are similar and demonstrates connectivity of the aquifer with bay water.

Conservative constituents including chloride, bromide, and major cations calcium, sodium, and potassium all suggest that a major proportion of the well water comes from marine water. Some degree of the well water consists of precipitation recharge (freshwater), presumably through lateral movement from the territorial side. The well water is characterized with lower salinity, lower pH, higher calcium/sodium ratio, and higher bicarbonate concentration. At this time, no intake credits are required and no further hydrogeologic characterization will be required. Ecology does not require a water right permit under Chapter 90.03 or Chapter 90.44 for the withdrawal or diversion of seawater from a marine water body (POL-1015).

The Permittee reports that the volume of daily water taken in or pumped into the hatchery is 1,075,500 gallons per day (gpd) for all departments (Algae, Larvae, and Setting). The Permittee also reports (SLR 2021,) that 51% of the seawater pumped into the hatchery is from the wells. Those volumes pumped consist of 117,900 gpd for the Algae Department and 431,996 gpd for the Larvae Departments.

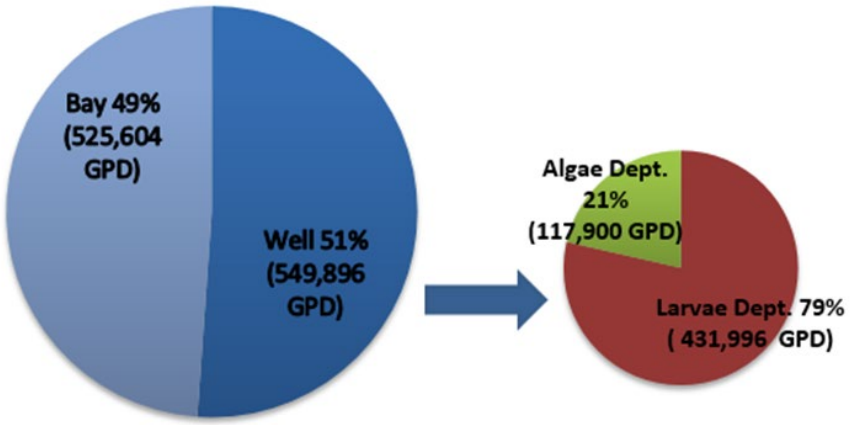


Figure 9 - Water intake (total pumped average = 1.075 MGD)

Data Summary: The Permittee reported the average daily flow and the concentration of constituents in the Hatchery's source water in the final engineering report (SLR 2021) submitted with their permit application in 2021. The water quantity data represents current and expected future production. The water quality data represents the quality of the wastewater effluent discharged from late July through October 2020. Below in Table 2, Ecology reports the statistically summarized source water data for each source water type.

Table 2 - Quilcene Bay Source Water Characterization [a]

	Salinity ppth	Temperature °C	pH s.u.	DO mg/L	TSS mg/L	Turbidity NTU	TOC mg/L	Ammonia [b] mg/L as N	Nitrate [bc] mg/L as N	Nitrite mg/L as N
mean	27.6	14.6	7.85	6.48	46	1.29	1.26	0.051	0.81	0.05
std dev	2.75	1.8	0.22	1.72	12	1.02	0.24	0.032	2.0	0.2
min	21.1	9.8	7.43	3.23	23	0.30	0.84	<0.020	0.007	0.002
max	29.9	16.4	8.29	8.56	55	3.80	1.70	0.129	6.10	0.500
median	28.9	14.7	7.82	6.87	49	1.15	1.25	0.047	0.20	0.003
90th percentile	29.6	16.1	8.07	8.01	54	2.09	1.52	0.078	1.5	0.06
95th percentile	29.8	16.3	8.18	8.29	55	2.95	1.61	0.10	3.8	0.3

	Bicarbonate mg/L	Bromide mg/L	Calcium mg/L	Chloride mg/L	Magnesium mg/L	Manganese [b] mg/L	Nitrite+Nitrate mg/L as N	Potassium mg/L	Sodium mg/L	Sulfate mg/L
mean	101	51	307	18170	1002	0.008	0.75	312	8622	2452
std dev	14	2.7	35	978	69	0.009	1.9	20	1041	476
min	66	45	250	16700	850	<0.005	0.007	290	6370	2180
max	110	54	350	20300	1100	0.033	6.10	350	9860	3780
median	105	50	315	18000	1000	0.005	0.17	315	8835	2320
90th percentile	110	54	341	19220	1100	0.008	0.93	332	9518	2583
95th percentile	110	54	346	19760	1100	0.020	3.5	341	9689	3182

Footnotes:

[a] Ten grab samples recorded from 7/28 through 12/9/2020 (n=10)

[b] When sample data less than detection limit, used detection limit to calculate summary statistics.

[c] One sample censored that was too high of detection limit; that DL was higher (>10x) than all the other analyses recorded so removed data point. (n=9)

[d] Only one sample was detected above limit

Table 3 - Subtidal Well Source Water (Seawater) [a]

	Salinity ppth	Temperature °C	pH s.u.	DO mg/L	TSS mg/L	Turbidity NTU	TOC mg/L	Ammonia [b] mg/L as N	Nitrate [c] mg/L as N	Nitrite mg/L as N
mean	22.3	16.3	7.03	6.17	34	0.27	0.94	0.108	0.686	0.064
std dev	2.9	1.5	0.21	1.17	7	0.12	0.37	0.066	0.209	0.153
min	14.8	12.5	6.79	4.20	25	0.12	0.51	<0.020	0.480	0.007
max	24.4	17.6	7.34	7.59	42	0.57	1.70	0.185	1.10	0.500
median	23.7	17.0	6.98	6.18	35	0.26	0.83	0.124	0.610	0.015
90th percentile	23.8	17.3	7.33	7.55	41	0.35	1.34	0.177	0.988	0.082
95th percentile	24.1	17.5	7.34	7.57	42	0.46	1.52	0.181	1.04	0.291

	Bicarbonate mg/L	Bromide mg/L	Calcium mg/L	Chloride mg/L	Magnesium mg/L	Manganese mg/L	Nitrite+Nitrate mg/L as N	Potassium mg/L	Sodium mg/L	Sulfate mg/L
mean	111	42	278	14860	834	0.022	0.68	253	7208	1893
std dev	5.7	1.6	28	919	36	0.016	0.21	12	872	96
min	100	39	240	13600	760	<0.005	0.50	240	5600	1800
max	120	44	320	16500	870	0.054	1.10	270	8160	2040
median	110	43	270	14800	835	0.022	0.62	250	7435	1865
90th percentile	120	44	311	16140	870	0.040	1.01	270	7989	2022
95th percentile	120	44	316	16320	870	0.047	1.06	270	8075	2031

Footnotes:

[a] Ten grab samples recorded from 7/28 through 12/9/2020 (n=10)

[b] When sample data less than detection limit, used detection limit to calculate summary statistics.

[c] One sample censored that was too high of detection limit; that DL was higher (>10x) than all the other analyses recorded so removed data point. (n=9)

II.C. Wastewater characterization

Pacific Shellfish reported the average daily flow and the concentration of pollutants in the Hatchery's effluent and the individual wastestreams in the final engineering report (SLR 2021) submitted with their permit application in 2021. The water quality data represents the quality of the wastewater effluent discharged from late July through October 2020.

The following tables and data summaries are Ecology's evaluation of the discharges. Data reported by the Permittee is grouped by outfalls discharging to Quilcene Bay, hatchery operations, and discharge type. The water quantity data represents current and expected future production.

While Ecology can summarize the individual wastestream data, the consolidated discharges proposed to occur at Quilcene Bay North (001) and South (002) have yet to be characterized. The proposed permit requires wastewater characterization, and the report will be submitted during the permit cycle both as regular monitoring and a study. Individual wastestream water quality data are summarized in Tables 4 through 8.

Table 4 - Wastewater Descriptions and Flow Regimes

Outfall & Receiving Waterbody	Hatchery Operation	Description of Discharge	Discharge Flow	Estimated Total Daily Flow gallons per day (gpd)
Outfall 001 North - Quilcene Bay	Setting: Single seed	Process water, Cleaning residuals and Tank drainage	Continuous	150,400 gpd (4 cleaning[a] events per month)
	Setting: Cultch	Cleaning residuals and Tank drainage	Intermittent	33,540 gpd (6.6 cleaning events per month)
	Source water	Filter backwash	Intermittent	1,500 gpd
	Algae	Cleaning residuals	Intermittent	220 gpd (28 cleaning events per month)
Outfall 002 South - Quilcene Bay	Source water	Headbox overflow and unused filter bay water	Continuous	253,700 gpd
	Source water	Filter backwash	Intermittent	16,500 gpd (Backwash once per day for 75gpm for ten minutes)
	Larvae	Process water, Cleaning residuals, and Tank drainage	Continuous	572,370 gpd [c] (74 cleaning events per month)
	Setting: Cultch	Cleaning residuals and Tank drainage	Intermittent	64,950 gpd (4.4 cleaning events per month)

Footnotes:

[a] Each cleaning event creates a cleaning residual discharge of approximately ten-gallons containing a mixture of rinse water, neutralized bleach, and biosolids (i.e., left over organic matter consisting of biofilm, shellfish larvae, shell particles, and/or alga from brushing tank surfaces).

Table 5 – Cultch Setting Discharges

Tank Drainage	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate [ab] mg/L as N*	*Nitrite [a] mg/L as N*	*BOD5 mg/L*	*Free Chlorine [c] mg/L*
n	13	13	13	13	13	13	13	13	12	13	13	13
mean	26.2	20.6	7.92	5.76	39	0.66	3.0	0.26	2.40	0.41	4.4	<0.02
std dev	2.2	2.0	0.22	1.62	9	0.48	2.2	0.19	2.18	0.42	2.6	0
min	21.7	16.0	7.56	3.37	22	0.24	1.5	0.05	<0.01	0.09	2.0	<0.02
max	30.0	22.5	8.36	8.03	53	2.00	9.9	0.69	7.10	1.40	12	<0.02
median	25.9	21.4	7.94	5.75	40	0.47	2.5	0.19	1.90	0.28	3.8	<0.02
90th percentile	28.4	22.2	8.18	7.82	50	1.11	4.0	0.53	5.14	1.03	5.7	<0.02
95th percentile	29.0	22.4	8.28	7.95	52	1.52	6.5	0.61	6.06	1.24	8.3	<0.02

Tank Cleaning Residuals	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate [ab] mg/L as N*	*Nitrite [a] mg/L as N*	*BOD5 mg/L*	*Free Chlorine [c] mg/L*
n	12	12	12	12	12	12	12	12	11	12	12	12
mean	7.4	16.3	8.75	7.51	276	274	35	0.51	6.8	0.1	59	<0.02
std dev	6.7	2.8	0.61	0.91	279	341	48	1.1	7.2	0.3	55	0
min	1.1	13.1	7.85	5.54	31	26	3.2	0.030	1.4	<0.002	2	<0.02
max	20.7	20.6	10.05	9.03	830	1200	180	3.8	26	1	190	<0.02
median	3.5	15.4	8.69	7.45	165	125	26	0.19	4.0	0.002	34	<0.02
90th percentile	14.4	20.2	9.58	8.18	714	591	44	0.53	15	0.2	118	<0.02
95th percentile	17.3	20.4	9.84	8.56	775	876	106	2.0	20	0.6	152	<0.02

Footnotes:

[a] One sample censored that was too high of detection limit; that DL was higher (>10x) than all the other analyses recorded so removed data point.

[b] When sample data less than detection limit, used detection limit to calculate summary statistics.

[c] Free chlorine was measured in the field using the Hach CN-70 low range free chlorine color disc test kit. The kit detection range is 0 - 3.2 mg/L with a minimum detection increment of 0.02 mg/L. Free chlorine was not detected in any sample.

Table 6 - Single Seed Setting Discharges

Tank Drainage	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate [a] mg/L as N*	*Nitrite [a] mg/L as N*	*BOD5 mg/L*	*Free Chlorine [b] mg/L*
n	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*4*	*4*	*5*	*4*
mean	*26.2*	*20.3*	*7.73*	*5.61*	*43*	*1.35*	*1.3*	*0.045*	*0.60*	*0.011*	*4.1*	<0.02
sd	*3.0*	*1.2*	*0.18*	*1.69*	*9*	*1.50*	*0.2*	*0.027*	*0.40*	*0.007*	*1.7*	0
min	*21.6*	*18.2*	*7.53*	*3.40*	*28*	*0.30*	*1.0*	*0.020*	*0.35*	*0.004*	*2.0*	<0.02
max	*28.7*	*21.2*	*8.01*	*8.09*	*50*	*3.90*	*1.6*	*0.089*	*1.20*	*0.018*	*6.2*	<0.02
median	*27.7*	*20.7*	*7.68*	*5.52*	*46*	*0.63*	*1.2*	*0.036*	*0.42*	*0.011*	*3.5*	<0.02
90th percentile	*28.5*	*21.2*	*7.92*	*7.22*	*50*	*2.94*	*1.5*	*0.075*	*0.97*	*0.017*	*5.8*	<0.02
95th percentile	*28.6*	*21.2*	*7.97*	*7.66*	*50*	*3.42*	*1.6*	*0.082*	*1.09*	*0.018*	*6.0*	<0.02

Tank Cleaning Residuals	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate mg/L as N*	*Nitrite mg/L as N*	*BOD5 mg/L*	*Free Chlorine [b] mg/L*
n	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
mean	*29.0*	*17.8*	*7.71*	*6.19*	*35*	*0.57*	*377*	*0.039*	*1.02*	*0.002*	*10*	<0.02
sd	*0.6*	*1.5*	*0.16*	*1.17*	*8*	*0.37*	*749*	*0.013*	*1.48*	*0.000*	*14*	0
min	*28.2*	*16.8*	*7.50*	*4.85*	*27*	*0.21*	*1.8*	*0.020*	*0.01*	*0.002*	*2.0*	<0.02
max	*29.7*	*20.0*	*7.89*	*7.70*	*45*	*0.93*	*1500*	*0.051*	*3.20*	*0.002*	*31*	<0.02
median	*29.1*	*17.2*	*7.72*	*6.11*	*34*	*0.57*	*3.0*	*0.042*	*0.44*	*0.002*	*2.7*	<0.02
90th percentile	*29.5*	*19.3*	*7.85*	*7.24*	*42*	*0.90*	*1051*	*0.048*	*2.45*	*0.002*	*23*	<0.02
95th percentile	*29.6*	*19.6*	*7.87*	*7.47*	*44*	*0.92*	*1276*	*0.050*	*2.83*	*0.002*	*27*	<0.02

Footnotes:
[a] One sample censored that was too high of detection limit; that DL was higher (>10x) than all the other analyses recorded so removed data point.
[b] Free chlorine was measured in the field using the Hach CN-70 low range free chlorine color disc test kit. The kit detection range is 0 - 3.2 mg/L with a minimum detection increment of 0.02 mg/L. Free chlorine was not detected in any sample.

Table 7 - Algae / Greenhouse Tank Discharges

Tank Drainage	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate mg/L as N*	*Nitrite mg/L as N*	*BOD5 mg/L*	*Free Chlorine [a] mg/L*
n	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
mean	*22.7*	*18.9*	*8.02*	*6.83*	*52*	*6.4*	*8.2*	*0.036*	*1.82*	*0.068*	*14*	<0.02
sd	*2.0*	*0.7*	*0.27*	*1.99*	*9.3*	*2.3*	*2.6*	*0.009*	*0.90*	*0.027*	*5.0*	0
min	*20.2*	*18.1*	*7.59*	*4.78*	*36*	*3.7*	*4.2*	*0.030*	*1.10*	*0.032*	*6.7*	<0.02
max	*24.6*	*19.6*	*8.26*	*9.65*	*59*	*9.1*	*11.0*	*0.050*	*3.30*	*0.090*	*20.0*	<0.02
median	*23.7*	*18.8*	*8.14*	*5.80*	*55*	*7.1*	*7.9*	*0.030*	*1.50*	*0.080*	*14.0*	<0.02
90th percentile	*24.4*	*19.6*	*8.23*	*9.03*	*58*	*8.6*	*10.6*	*0.046*	*2.78*	*0.090*	*18*	<0.02
95th percentile	*24.5*	*19.6*	*8.25*	*9.34*	*59*	*8.9*	*10.8*	*0.048*	*3.04*	*0.090*	*19*	<0.02

Tank Cleaning Residuals	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate mg/L as N*	*Nitrite mg/L as N*	*BOD5 mg/L*	*Free Chlorine [a] mg/L*
n	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
mean	*6.8*	*15.7*	*8.27*	*7.53*	*38*	*38*	*6.5*	*0.056*	*20.0*	*0.003*	*16*	<0.02
sd	*2.5*	*0.8*	*0.90*	*0.83*	*17*	*29*	*6.6*	*0.017*	*19.8*	*0.002*	*15*	0
min	*2.4*	*14.5*	*7.50*	*6.10*	*17*	*12*	*1.6*	*0.040*	*0.3*	*0.002*	*2.0*	<0.02
max	*8.7*	*16.6*	*9.61*	*8.19*	*60*	*82*	*18.0*	*0.080*	*50.0*	*0.006*	*34.0*	<0.02
median	*7.9*	*15.6*	*7.95*	*7.85*	*35*	*27*	*4.1*	*0.060*	*13.0*	*0.002*	*8.7*	<0.02
90th percentile	*8.5*	*16.4*	*9.26*	*8.08*	*56*	*70*	*12.8*	*0.072*	*41.6*	*0.004*	*32*	<0.02
95th percentile	*8.6*	*16.5*	*9.44*	*8.14*	*58*	*76*	*15.4*	*0.076*	*45.8*	*0.005*	*33*	<0.02

Footnotes:
[a] Free chlorine was measured in the field using the Hach CN-70 low range free chlorine color disc test kit. The kit detection range is 0 - 3.2 mg/L with a minimum detection increment of 0.02 mg/L. Free chlorine was not detected in any sample.

Table 8 - Process Water Discharge

Former Outfall Q03	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia mg/L as N*	*Nitrate [a] mg/L as N*	*Nitrite [a] mg/L as N*	*BOD5 [b] mg/L*	*Free Chlorine [c] mg/L*
n	9	9	9	9	8	8	8	8	7	7	8	9
mean	25.2	16.0	7.98	6.26	35	0.97	1.3	0.21	0.60	0.12	4.2	<0.02
sd	2.3	0.8	0.15	1.46	13	0.96	0.58	0.07	0.37	0.13	2.5	0
min	21.0	14.8	7.72	3.55	17	0.25	0.80	0.07	0.27	0.033	2.0	<0.02
max	27.7	17.7	8.23	7.66	60	3.20	2.5	0.31	1.4	0.40	8.3	<0.02
median	25.9	16.0	7.95	6.43	33	0.66	1.0	0.21	0.50	0.084	3.4	<0.02
90th percentile	27.5	16.6	8.15	7.57	48	1.8	1.9	0.27	0.94	0.23	7.7	<0.02
95th percentile	27.6	17.1	8.19	7.62	54	2.5	2.2	0.29	1.2	0.32	8.0	<0.02

Former Outfall Q04	*Salinity ppth*	*Temperature °C*	*pH s.u.*	*DO mg/L*	*TSS mg/L*	*Turbidity NTU*	*TOC mg/L*	*Ammonia [b] mg/L as N*	*Nitrate [a] mg/L as N*	*Nitrite [a] mg/L as N*	*BOD5 [b] mg/L*	*Free Chlorine [c] mg/L*
n	*9*	*9*	*9*	*9*	*8*	*8*	*8*	*8*	*7*	*7*	*8*	9
mean	*24.7*	*18.0*	*8.04*	*6.30*	*39*	*0.80*	*1.2*	*0.088*	*1.00*	*0.07*	*4.3*	<0.02
sd	*2.0*	*1.3*	*0.18*	*1.43*	*7*	*0.87*	*0.42*	*0.077*	*0.40*	*0.18*	*1.8*	0
min	*21.5*	*15.8*	*7.82*	*3.76*	*26*	*0.18*	*0.60*	*<0.020*	*0.80*	*0.002*	*<2.0*	<0.02
max	*28.2*	*20.3*	*8.34*	*7.97*	*52*	*2.80*	*1.8*	*0.250*	*1.9*	*0.47*	*7.2*	<0.02
median	*25.3*	*18.1*	*8.00*	*6.53*	*40*	*0.42*	*1.2*	*0.060*	*0.85*	*0.01*	*3.7*	<0.02
90th percentile	*26.3*	*19.4*	*8.28*	*7.68*	*45*	*1.68*	*1.6*	*0.180*	*1.3*	*0.2*	*6.9*	<0.02
95th percentile	*27.2*	*19.9*	*8.31*	*7.83*	*49*	*2.24*	*1.7*	*0.215*	*1.6*	*0.3*	*7.0*	<0.02

Footnotes:

[a] One sample censored that was too high of detection limit; that DL was higher (>10x) than all the other analyses recorded so removed data point.

[b] When sample data less than detection limit, used detection limit to calculate summary statistics.

[c] Free chlorine was measured in the field using the Hach CN-70 low range free chlorine color disc test kit. The kit detection range is 0 - 3.2 mg/L with a minimum detection increment of 0.02 mg/L. Free chlorine was not detected in any sample.

II.D. Summary of compliance

The proposed permit is the first for the Hatchery. It is the result of a Clean Water Act citizen suit. A court decision in March 2018 held that the facility discharged in a manner that required authorization in accordance with the Clean Water Act. Ecology's position leading up to the U.S. Court of Appeals decision in 2018 was the Hatchery did not meet EPA's Concentrated Aquatic Animal Production Facility definition as a point source (40 C.F.R. § 122.24; 40 C.F.R. pt. 122, App. C) and as a result did not require an NPDES permit to authorize the discharges. Ecology reviewed the permittee's 2013 effluent study and had determined that Quilcene Bay water quality was unlikely to be altered.)

II.E. State environmental policy act (SEPA) compliance

State law exempts the issuance, reissuance, or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, such as is the case with Pacific Shellfish-Quilcene's hatchery, and not to new discharges or new facilities.

III. Proposed permit limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the Federal Water Quality Criteria Applicable to Washington (40 CFR 131.45).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize

discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

III.A. Design criteria

Categorical design criteria do not exist for shellfish hatcheries nor does this facility have site specific criteria.

III.B. Technology-based effluent limits

Shellfish hatcheries do not have federal effluent limit guidelines therefore similar industry standards and best professional judgement were used to determine limits. The Permittee reported that they do not treat any discharges other than to neutralize bleach for total residual chlorine in the tank cleaning residual wastestream. The parameters of concern include total residual chlorine, ammonia, pH, solids, and heat load (temperature).

Ecology must ensure that facilities provide all known, available, and reasonable methods of prevention, control, and treatment (AKART) when it issues a permit. The neutralization to remove total residual chlorine is the minimum treatment and a best management practice requirement of the proposed permit constituting a narrative technology-based effluent limit.

The pH of the discharges from the two outfalls is moderated by the quantity of seawater mixing with individual wastestreams. Compliance with technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water.

The resultant effluent limits are as follows:

Outfalls	Parameter	Minimum	Maximum
Quilcene Bay North (001)	pH	6.0 standard units	9.0 standard units
Quilcene Bay South (002)	pH	6.0 standard units	9.0 standard units

In the time leading up to the writing of this second draft permit, Pacific Shellfish has reduced the number of outfalls from nearly 30 to just 2, removing all the segregated discharges of cleaning residuals directly to a surface waterbody. This action is considered prevention and control of pollutants. The consolidation of all the wastestreams into two outfalls has created new effluent discharges to be characterized further and as a result AKART needs to determine on a site-specific basis.

In the proposed permit, a compliance schedule requires the Permittee perform a wastewater characterization and engineering reporting with an alternatives assessment for the treatment of removed solids of the tank cleaning residuals and media filter backwash. The Permittee will also be required to do a receiving water study for turbidity to establish ambient conditions. The evaluations will also include a recommendation for technology-based effluent limits and a comparison to the effluent standards in WAC 173-221A-100 for fish hatchery solids and the relevant water quality standards criteria.

The proposed permit contains a requirement under the compliance schedule for the Permittee to perform a temperature receiving waterbody study. The reports are due before the proposed permit expiration.

As a result of the compliance schedule required reporting over the permit cycle, Ecology may implement more stringent limits through a permit modification or when the permit is renewed next. The accompanying permit focuses on water quality-based limits and Ecology will evaluate all limits leading up to the next permit after the required reporting is complete.

III.C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

1. Numeric criteria for the protection of aquatic life and recreation

Numeric water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

2. Numeric criteria for the protection of human health

Numeric criteria for the protection of human health are promulgated in Chapter 173-201A WAC and 40 CFR 131.45. These criteria are designed to protect human health from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

3. Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1)) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200) and of all marine waters (WAC 173-201A-210) in the state of Washington.

4. Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

  Tier I: ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution.

  Tier II: ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities.

  Tier III: prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.

- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility specific requirements – This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- Ecology's analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

5. Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones, the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution (WAC 173-201A-400 (7)).

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur. Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life acute criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Each aquatic life chronic criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two and four tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit does not authorize a mixing zone. The Permittee may submit a mixing zone study, for Ecology's consideration, to evaluate whether a mixing zone is warranted for the discharge. If considering conducting and submitting a study the Permittee should discuss the applicable requirements with Ecology.

III.D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. The table included below summarizes the criteria applicable to this facility's discharge.

1. Marine water aquatic life uses and associated criteria

The aquatic life uses and the associated criteria for this receiving water are identified below. All indigenous fish and non-fish aquatic species must be protected in waters of the state.

Extraordinary quality

Aquatic life uses: salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

Table 9 - Extraordinary quality criteria

Criteria	Value
Temperature – Highest 1DMax	13°C (55.4°F)
Dissolved Oxygen – Lowest 1-Day minimum	7.0 mg/L
Turbidity	5 NTU over background when the background is 50 NTU or less; or A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
pH	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.2 units.

2. Shellfish harvesting use and criteria

To protect shellfish harvesting, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.

3. Recreational use and criteria

The recreational use is primary contact recreation. Enterococci organism levels within an averaging period must not exceed a geometric mean of 30 CFR or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample values exist) obtained within the averaging period exceeding 110 CFU or MPN per 100 mL.

4. Miscellaneous marine water uses

The miscellaneous marine water uses are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

III.E. Water quality impairments

Ecology has not documented any water quality impairments in the receiving water in the vicinity of the outfall. There are only Category 2 listings for bacteria in the bay and phenol in the sediment. Neither of these parameters are found in, nor are results, of the discharges from the hatchery.

III.F. Evaluation of surface water quality-based effluent limits for narrative criteria

Ecology must consider the narrative criteria described in WAC 173-201A-260 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may

discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (AKART) as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

III.G. Evaluation of surface water quality-based effluent limits for numeric criteria

1. Mixing zones and dilution factors

Ecology has not authorized a mixing zone in the permit.

2. pH

Compliance with technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water. Tank cleaning residuals containing sodium hypochlorite have elevated pH above the water quality criterion for pH of 8.5. Cleaning residuals are segregated wastestreams of very small volumes (10 gallons) that may be discharged on average 10 times per day. With consolidation of process water and overflow water at outfalls 001 and 002 with segregated wastestreams, cleaning residuals will mix with nearly 185,660 gpd and 907,840 gpd of seawater, respectively. The seawater ranges from 21 to 28 ppt. The high buffering capacity of this quantity of seawater mixing with the cleaning residuals prevents pH from being altered in a deleterious manner that would exceed water quality criteria at the compliance point (i.e., end of pipe). The proposed process water limits will be implemented through continuous monitoring. The purpose for pH limitations and monitoring at each outfall is to ensure no error in the manual tank cleaning process.

3. Bacteria

The discharges do not contain any fecal coliform, E. coli, or enterococci as there is no septic system or municipal sewer wastewater connected to the Hatchery's outfalls. There is no risk of these bacteria being produced either from the rearing of shellfish or culturing of algae.

4. Turbidity

Ecology evaluated the impact of turbidity based on the range of turbidity in the effluent and turbidity of the receiving water. Because of the limited information

the source water data represented and the consolidation of the outfalls, a turbidity receiving water quality study will be required as part of the compliance schedule in the proposed permit.

5. Toxic pollutants

Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present or potentially present in the discharge: ammonia and total residual chlorine. Ecology conducted a reasonable potential analysis (See Appendix D) on these parameters to determine whether it would require effluent limits in this permit.

Ammonia: Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature, pH, and salinity of the receiving marine water. To evaluate ammonia toxicity, Ecology used the available receiving water information based on the average bay water characteristics (Table 2 – Quilcene Bay Source Water Characterization [a]) and Ecology spreadsheet tools.

During the writing of the first draft permit, Ecology determined there was reasonable potential of tank cleaning residuals but not tank drainage to discharge above the ammonia aquatic life chronic criterion when discharged from outfalls in a segregated manner. Since the facility is now consolidating to two outfalls, effectively collecting the overflow and flow-through process water together with the previously segregated cleaning residual wastestreams, the effluent from outfalls 001 and 002 will no longer have reasonable potential. The reason being that the cleaning residual wastestreams consist of very small volumes (10 gallons) that may be discharged on average 10 times per day. Tank cleaning residuals will mix with nearly 185,660 gpd and 907,840 gpd of seawater, respectively from outfalls 001 and 002. When calculating how the segregated discharges dilute into the consolidated effluent, the gpd was divided by how many gallons would be flowing at a one-minute interval. The minimum dilution factor of 129 was used to determine the potential ammonia levels in the discharges from each retrospective outfall. Ammonia will be required to be monitored and reported at each outfall to confirm the new effluent characteristics.

Ecology determined that ammonia posed no reasonable potential to cause or contribute to exceedances of the water quality criteria at the critical condition using procedures given in the *Technical Support Document for Water Quality-Based Toxics Control* (USEPA, 1991) (Appendix D) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

Total Residual Chlorine: As a standard operation procedure, the Permittee neutralizes chlorine in all tank cleaning residuals using either sodium thiosulfate (cultch operations and algae department) or hydrogen peroxide (single seed operation). The Permittee reported that no cleaning waste residual discharge had detectable free chlorine above the method detection limit of 0.02mg/L or 20 µg/L. As reported in Section IID. Wastewater Characterization, there is little potential to violate the water quality standard for the acute or chronic aquatic life criteria if neutralization occurs. Additionally, considering outfall consolidation, these wastestreams will mix with continuous flowing process water. Each tank cleaning event will mix with nearly 185,660 gpd and 907,840 gpd of seawater, respectively prior to exiting outfalls 001 and 002. However, neutralization is a manual process thereby tank cleaning residuals have some human error potential to be discharged without treatment. As a result, a best management practice plan (see Special Condition S5) must be developed and followed indicating tank cleaning residuals are monitored to ensure neutralization treatment was effective.

The tank cleaning and neutralization process for each operation and department will become a standard operating procedure that will be described in a permit required Best Management Practices Plan (S5). Practices to be followed include that every tank cleaning event is neutralized, tested, recorded, regular compliance testing is performed using accredited lab and method with the lowest possible detection limit, and total residual chlorine levels reported are at or below the method detection limit of the field and accredited compliance tests. There are several cleaning events every day, and each cleaning event is subjected to the BMPs and must be tested.

A maximum daily effluent limit is set in the proposed permit to the acute aquatic life criterion for marine waters. Compliance with the limit will be reported through monthly testing using an accredited lab and methodology for effluent discharged from each outfall. Compliance with this water quality based effluent limit is dependent on the compliance schedule whereby the Permittee has one year to become accredited and at that time, compliance monitoring and reporting must commence.

The resultant effluent limits are as follows:

Outfalls	Parameter	Average Monthly Limit	Maximum Daily Limit
Quilcene Bay North (001)	Total Residual Chlorine	NA	13.0 µg/L

Quilcene Bay South (002)	Total Residual Chlorine	NA	13.0 µg/L

The proposed permit contains a compliance schedule for meeting the water quality-based limits for chlorine (total residual). Prior to authorizing this compliance schedule, Ecology required Pacific Shellfish to evaluate the possibility of becoming an accredited lab to perform compliance testing. The proposed permit contains one year timeframe to become accredited and in the interim use internal process control testing and reporting to meet limits for chlorine (total residual) as required by chapter 173-201A WAC. Ecology based these limits on past monitoring results and existing demonstrated performance.

6. Temperature

The state temperature standards for marine waters (WAC 173-201A-210) include multiple elements:

a. Annual 1-Day maximum criteria
b. Incremental warming restrictions
c. Guidelines on preventing acute lethality and barriers to migration of salmonids

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

a. Annual 1-Day maximum criteria

Each marine water body has an annual maximum temperature criterion [WAC 173-201A-210(1)(c)(i)-(ii) and WAC 173-201A-612]. These threshold criteria (e.g., 13, 16, 19, 22°C) protect specific categories of aquatic life by controlling the effect of human actions on water column temperatures. The threshold criteria apply at the edge of the chronic mixing zone. Criteria for marine waters and some fresh waters are expressed at the highest 1-Day annual maximum temperature (1-DMax). Ecology concludes that there is no reasonable potential to exceed the temperature standard when the mixture of ambient water and effluent at the edge of the chronic mixing zone is less than the criteria of 13°C.

b. Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone. At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment (T_i), calculated as:

$T_i = 12/(T_{amb} - 2)$

This increment is permitted only to the extent doing so does not cause temperatures to exceed the annual maximum criteria.

c. Guidelines to prevent acute mortality or barriers to migration of salmonids. These site-level considerations do not override the temperature criteria listed above.
   i. Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C 2-seconds after discharge.
   ii. General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C. When adjacent downstream temperatures are 3°C or cooler, the 1DMax at the edge of the chronic mixing zone must not exceed 22°C.
   iii. Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

Reasonable potential analysis

Data collection required: Ecology does not have sufficient information on the temperature of the effluent or the receiving water to determine compliance with the water quality criterion for temperature. The proposed permit requires Pacific Shellfish to monitor effluent and submit a receiving waterbody study for temperature. Additionally, the Permittee must also report a heat load balance and inventory. Ecology will assess water quality-based effluent limits with the information from the receiving water body study submitted.

General lethality and migration blockage: While there is insufficient temperature data, Pacific Shellfish does warm their water above 23°C for growth of larvae and seed. The potential to discharge above 23.0°C when mixing 185,660 gpd (outfall 001) and 907,840 gpd (outfall 002) is unclear. Ecology is setting the following limit so the discharges will not exceed the acute mortality criterion or create a migration barrier if receiving water conditions were to exceed a 1DMax of 23°C. There is no mixing zone authorized.

The resultant effluent limits are as follows:

Outfalls	Parameter	Average Monthly Limit	Maximum Daily Limit
Quilcene Bay North (001)	Temperature	NA	23.0°C
Quilcene Bay South (002)	Temperature	NA	23.0°C

III.H. Human health

Washington's water quality standards include numeric human health-based criteria for priority pollutants that Ecology must consider when writing NPDES permits.

Ecology determined the applicant's discharges are unlikely to contain chemicals regulated to protect human health. The effluent does not contain chemicals of concern based on existing effluent data or knowledge of discharges to the system. Ecology will reevaluate this discharge for impacts to human health at the next permit reissuance.

III.I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website[1].

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

III.J. Groundwater quality limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

Pacific Shellfish-Quilcene LLC does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

III.K. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Using the screening criteria in chapter 173-205-040 WAC, Ecology determined that toxic effects caused by unidentified pollutants in the effluent are unlikely. Therefore, this permit does not require WET testing. Ecology may require WET testing in the future if it receives information indicating that toxicity may be present in this effluent.

[1] https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups

IV. Monitoring requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

IV.A. Wastewater monitoring

Pacific Shellfish will monitor at each outfall for flow, temperature, pH, turbidity, salinity, ammonia, BOD_5 TSS, and TOC to further characterize the effluent. These pollutant(s) or parameters that affect pollutants could have a significant impact on the quality of the surface water. Flow, temperature, and pH will be continuously monitored. Total residual chlorine is monitored in each tank or rearing vessel prior to release.

Total residual chlorine must be monitored using both field and compliance testing. Monitoring using field testing consists of in field, real-time testing performed on each discharge using kit methodology that may not be EPA approved and that does not require facility to have lab accreditation but must follow the approved best management practices plan, standard operation procedure (SOP), described in condition S5. The periodic, regular compliance testing must be conducted using approved methodology (40 CFR Part 136) and an accredited laboratory (chapter 173-50 WAC). All field data must be recorded and reported in the appropriate manner in the testing log specified in the approved SOP. Compliance monitoring is done in accordance with the monitoring schedule in condition S2 and must be reported on the discharge monitoring reports (DMRs).

The monitoring schedule is described in the proposed permit under Special Condition S.2. Specified monitoring frequencies consider the quantity and variability of the discharge, the treatment method, past compliance, and significance of pollutants.

IV.B. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (except for certain parameters). Ecology has listed in the compliance schedule of the proposed permit that Pacific Shellfish – Quilcene LLC become accredited within a year after the permit is issued for the determination of total residual chlorine.

IV.C. Effluent limits which are near detection or quantitation levels

The water quality-based effluent concentration limits for total residual chlorine are near the limits of current analytical methods to detect or accurately quantify. The method detection level (MDL) also known as detection level (DL) is the minimum concentration of a pollutant that a laboratory can measure and report with a 99 percent confidence that its concentration is greater than zero (as determined by a specific laboratory method). The quantitation level (QL) is the level at which a laboratory can reliably report concentrations with a specified level of error. Estimated concentrations are the values between the DL and the QL. Ecology requires permitted facilities to report estimated concentrations. When reporting maximum daily effluent concentrations, Ecology requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level.

Total Residual Chlorine: The water quality-based effluent concentration limits for total residual chlorine are near or below the limits of current analytical methods to detect or accurately quantify. Both field and compliance monitoring must use the appropriately sensitive method to report compliance with the water quality-based effluent limits. Reporting that the concentration is below the lowest possible detection limit using the appropriately sensitive test can indicate that the discharges meet permit limits. The Permittee complies with effluent limit if reported results are non-detectable and below the lowest possible method detection limit if using the sufficiently sensitive and approved SOP method for field testing and EPA approved method for compliance testing.

V. Other permit conditions

V.A. Reporting and record keeping (Permit Condition S3)

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

V.B. Operation and maintenance manual (Permit Condition S4)

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)]. The facility will prepare and submit an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

O&M Manual: This proposed permit requires Pacific Shellfish – Quilcene LLC, the hatchery, to submit an O&M manual one year prior to permit expiration along with its renewal application.

The Hatchery uses heat exchangers, media filtration, backup generators, and continuous monitoring equipment. Each process and the associated equipment affect or is related to the condition of downstream wastewater discharges with potential to alter water quality of the receiving waterbody. As a result, these processes shall be included in the operation and maintenance manual.

V.C. Best management practices (Permit Condition S5)

Best management practices (BMPs) are the actions identified to manage, prevent contamination of, and treat stormwater. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment systems, operating procedures, and practices used to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage.

The Permittee must develop a BMP plan to include:

- SOP for Tank Cleaning and Management of Waste Residuals. This SOP must be approved and shall include:
    i. Procedure for Tank Cleaning that contain descriptions of chemical use for complete neutralization of free chlorine with indication of how to calculate, administer, and report by trained staff.
    ii. Field and compliance testing procedures that contain descriptions to conduct each to ensure reporting in compliance with permit.
    iii. Chemical Use and Testing Logs to record the use of chemicals to clean and neutralize, and record of the corresponding field and compliance testing.
- Lab equipment and surface cleaning procedures
- Aquatic Invasive Species Prevention and Reporting Procedures
- Stormwater Runoff Management BMPs

V.D. Spill control plan (Permit Condition S7)

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

The proposed permit requires this facility to develop and implement a Spill Control Plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs.

V.E. Compliance schedule (Permit Condition 8)

In accordance with WAC 173-201A-510 (4), the proposed permit includes a Compliance Schedule with due dates. The schedule includes the following:

- Lab accreditation, method approval, and compliance monitoring for total residual chlorine
- Quilcene Bay Receiving Waterbody Studies for Temperature and Turbidity
- Engineering Reporting to include wastewater characterization and alternative analyses to include recommendations, basic plan drawings, and preliminary specifications for treatment or control of removed solids present in the cleaning residuals and media filter backwash wastestreams.

V.F. Intake structure inspection and report requirements (Permit Condition S11)

Pacific Shellfish – Quilcene, LLC submitted with their permit application the information required by 40 CFR 122.21(r).

The Permittee will conduct an inspection of all intakes, determine the presence of and report screen size (i.e., mesh size and construction), install screens if determined they are not present, and provide engineering drawings (as-built drawings) of all intakes with respective screens. The reporting shall follow “Cooling water intake structure data” reporting under 40 CFR 122.21(r)(3).

V.G. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual industrial NPDES permits issued by Ecology.

VI. Permit issuance procedures

VI.A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwaters, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

VI.B. Proposed permit issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of **five** years.

VII. References for text and appendices

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Ecology. (2016). *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (Publication 95-80).* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9580.html

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Ecology. (2019). *Stormwater Management Manual for Eastern Washington, Publication 18-10-044.* Retrieved from https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm

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USEPA. (1985). *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. Part 2, EPA/600/6-85/002B.*

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USEPA Region 10. (2021). *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load.* Seattle, WA.

Pacific Seafood Group

May 6, 2022. Email response with attachment from Miranda Ries of the Pacific Seafood Group to Laurie Niewolny. *Responses for Pac Shellfish 042122 LAN.*

May 22, 2022. Email response with attachment from Miranda Ries of the Pacific Seafood Group to Laurie Niewolny. *Response to Ecology Comments 4_Apr 2022*.

May 22, 2022. Email response with attachment from Miranda Ries of the Pacific Seafood Group to Laurie Niewolny. *Question 4 follow up for Pac Shellfish 05062022 LAN*.

June 6, 2022. Email response with EPA Cooling Structure Form attachment and response from Miranda Ries of the Pacific Seafood Group to Laurie Niewolny. *Form 2c.PDF and DOE responses.PDF*.

SLR International Corporation

February 2021. SLR International Corporation. **Engineering Report, Water Balance, Effluent Characterization, & Hydrogeologic Connectivity Study**, Client Ref: 108.01995.00001. Pacific Seafood Group, Coast Seafoods Company-Quilcene Hatchery. Quilcene, WA.

Washington State and Ecology website general reference links:

Laws and Regulations[2]

Permit and Wastewater Related Information[3]

[2] http://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx
[3] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance

Appendix A – Public Involvement Information

Ecology proposes to issue a permit to Pacific Shellfish – Quilcene, LLC. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on June 5 and June 12, 2019; June 10 and June 17, 2020; June 16 and June 23, 2021; and June 8 and June 15, 2022 in the Port Townsend Leader to inform the public about the submitted application and to invite comment on the issuance of this permit.

Ecology will place a Public Notice of Draft on date in the Port Townsend Leader to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period
- Tells how to request a public hearing of comments about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

Frequently Asked Questions about Effective Public Commenting[4]

You may obtain further information from Ecology by telephone at 360-706-4191 or by writing to the address listed below.

Water Quality Permit Coordinator Department of Ecology

Southwest Region Office

P.O. Box 47775

Olympia, WA 98504-7775

The primary author of this permit and fact sheet is Laurie Niewolny.

[4] https://apps.ecology.wa.gov/publications/SummaryPages/0307023.html

Appendix B – Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. "Notice of appeal" is defined in WAC 371-08-340.
- Serve a copy of your appeal and this permit on Ecology on the Department of Ecology mail, in person, or by email (see addresses below).
- You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Filing with the PCHB

For the most current information regarding filing with the PCHB:
visit https://eluho.wa.gov/[5] or call 360-664-9160.

Service on Ecology

Street Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

[5] https://eluho.wa.gov/

Appendix C – Glossary

1-DMax or 1-day maximum temperature – The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures – The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity – The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART – The acronym for “all known, available, and reasonable methods of prevention, control and treatment.” AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and RCW 90.48.520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance – An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An “early warning value” must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality – The existing environmental condition of the water in a receiving water body.

Ammonia – Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) – average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit – The average of the measured values obtained over a calendar months’ time taking into account zero discharge days.

Average monthly discharge limit – The average of the measured values obtained over a calendar months’ time.

Background water quality – The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity, [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) – Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5 – Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass – The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards – National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine – A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic toxicity – The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA) – The federal Water Pollution Control Act enacted by Public Law 92 500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling – A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling – A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample – A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity – Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring – Uninterrupted, unless otherwise noted in the permit.

Critical condition – The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Date of receipt – This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection level – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

Dilution factor (DF) – A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity – The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Early warning value – The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit – The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report – A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or WAC 173-240-130.

Enterococci – A subgroup of fecal streptococci that includes *S. faecalis*, *S. faecium*, *S. gallinarum*, and *S. avium*. The enterococci are differentiated from other streptococci by their ability to grow in 6.5% sodium chloride, at pH 9.6, and at 10°C and 45°C.

E. coli – A bacterium in the family Enterobacteriaceae named Escherichia coli and is a common inhabitant of the intestinal tract of warm-blooded animals, and its presence in water samples is an indication of fecal pollution and the possible presence of enteric pathogens.

Fecal coliform bacteria – Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample – A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater – Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user – A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater – Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of

any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference – A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits – Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility – A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit – The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) – The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) – The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) – The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection limit (MDL) – See Detection level.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone – An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) – Section 402 of the Clean Water Act, the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State are joint NPDES/State permits issued under both state and federal laws.

pH – The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through – A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) – The largest volume of flow anticipated to occur during a

one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) – The maximum anticipated instantaneous flow.

Point of compliance – The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potential significant industrial user (PSIU) – A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) – also known as Minimum level (ML) – The term ‘‘minimum level’’ refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: ‘‘quantitation limit,” ‘‘reporting limit,’’ and ‘‘minimum level’’.

Reasonable potential – A reasonable potential to cause or contribute to a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer – A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum – No sample may exceed this value.

Significant industrial user (SIU) –

- All industrial users subject to Categorical Pretreatment Standards under 40 CFR Chapter I, Subchapter N and 40 CFR 403.6 and;
- Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

Upon finding that the industrial user meeting the criteria in the second paragraph has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge – Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist – An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste – All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 – Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

State waters – Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater – That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit – A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria – A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids – That portion of total solids in water or wastewater that passes through a specific filter.

Total maximum daily load (TMDL) – A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

Total suspended solids (TSS) – Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset – An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit – A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D – Technical Calculations

Ecology uses spreadsheet tools to determine reasonable potential (to cause or contribute to violations of the aquatic life and human health water quality numeric standards) and to calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets come from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001) (USEPA, 1991). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b).

Reasonable Potential Analysis:

Reasonable potential calculation for ammonia in marine waters

The spreadsheets “Input 2 – Reasonable Potential” and “NH3-marine” in Ecology’s PermitCalc Workbook determine reasonable potential to violate the aquatic life water quality standards and calculate effluent limits for marine waters respectively. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets are taken directly from the Technical Support Document for Water Quality-based Toxics Control, (EPA 505/2-90-001). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b). Below is the table indicating that with the newly configured consolidation, mixing process water with previously segregated discharges, the mixing and dilution creates a discharges that no longer have a reasonable potential to violate these water quality standards.

Table 10 - Ammonia Reasonable Potential Calculation

Dilution Factors:

Only Aquatic Life (no mixing zone); no human health criteria for ammonia. Dilution indicates the mininmum mixing of tank cleaning residuals with process water that discharges from Q0001 and 0002.	Acute	129	Chronic	129

Discharges:	Hatchery Operation:		Cultch Setting	Cultch Setting	All Processes	All Processes
	Type of Wastewater Discharged:		Cleaning Residuals -Segregated wastestream	Tank drainage - Segregated wastestream	Process Water and Wastestreams	Process Water and Wastestreams
	Flow:		Intermittent	Intermittent	Continuous	Continuous
	Outfall(s):		01, 2D, 05	01, 2D, 05	03	04
	Pollutant		AMMONIA, Criteria as Total NH3			
Effluent Data	# of Samples (n)		12	13	8	8
	Coeff of Variation (Cv) Use default CV of 0.6 when sample size is <20.		0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Use maximum when n<20)		3,840	690	310	250
Receiving Water Data	90th Percentile Conc., ug/L		78	78	78	78
Water Quality Criteria	Aquatic Life Criteria, ug/L (based on NH3-marine criteria calc)	Acute	6,510	6,510	6,510	6,510
		Chronic	978	978	978	978
	WQ Criteria for Protection of Human Health, ug/L == None for Ammonia		-	-	-	-
	Metal Criteria Translator, decimal == None for Ammonia	Acute	-	-	-	-
		Chronic	-	-	-	-
	Carcinogen?		N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value			0.950	0.950	0.950	0.950
s	$s^2=\ln(CV^2+1)$		0.555	0.555	0.555	0.555
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.779	0.794	0.688	0.688
Multiplier			1.63	1.58	1.90	1.90
Max concentration (ug/L) at edge of...		Acute	125	86	82	81
		Chronic	125	86	82	81
Reasonable Potential? Limit Required? *			**NO**	**NO**	**NO**	**NO**

Appendix E – Response to Comments

[Ecology will complete this section after the public notice of draft period.]