State of Oregon
Department of
Environmental
Quality

National Pollutant Discharge Elimination System
Permit Fact Sheet
City of Bay City

Final: September 26, 2024

Permittee	City of Bay City 8000 Elliott St Bay City, OR 97107
Existing Permit Information	File Number: 6667 Permit Number: 101025 EPA Reference Number: OR0022578 Category: Domestic Class: Minor Expiration Date: 10/31/2024
Permittee Contact	Donald Miller Wastewater Operator 503-377-4174 P.O. Box 3309 Bay City, OR 97107
Receiving Water Information	Receiving stream/NHD name: Tillamook Bay NHD Reach Code & % along reach: 17100203011280, 64% along reach USGS 12-digit HUC: 171002030800, Tillamook Bay OWRD Administrative Basin: North Coast ODEQ LLID & River Mile: 1239378455599, RM 3.49 Assessment Unit ID: OR_EB_1710020308_01_100298
Proposed Action	Permit Renewal Application Number: 948149 Date Application Received: 3/5/2024
Permit Writer	Olivia Stoken 971-867-1077 Date Prepared: 8/15/2024

NPDES Permit Fact Sheet
City of Bay City

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1. Introduction

As required by Oregon Administrative Rule 340-045-0035, this fact sheet describes the basis and methodology used in developing the permit. The permit is divided into several sections:

Schedule A – Waste discharge limitations
Schedule B – Minimum monitoring and report requirements
Schedule C – Compliance conditions and schedules
Schedule D – Special conditions
Schedule E – Pretreatment conditions
Schedule F – General conditions

Below is a summary of the major changes to the permit:

Schedule A:

- New effluent limits for total ammonia have been added in Table A1.
- More stringent effluents limit for fecal coliform bacteria and pH have been added in Table A1.

Schedule B:

- Influent and effluent monitoring requirements in Tables B2 and B3 have been updated to meet current monitoring matrix requirements, except CBOD, BOD, and TSS which have been updated based on a monitoring reduction request analysis.
- Receiving water body monitoring in Tillamook Bay has been added in Table B4.

Schedule C

- Compliance schedules for pH, total ammonia, and fecal coliform bacteria limits have been added in Table C1 and Table C2.

Schedule D:

- Special conditions added to proposed permit include 7.4 Wastewater Solids Annual Report, 7.5 Biosolids Management Plan, 7.7 Hauled Waste Control Plan, 7.8 Hauled Waste Annual Report, 7.9 Lagoon Solids, and 7.12 Outfall Inspection. Special conditions removed from previous permit include 7.2 Mixing Zone Study.

2. Facility Description

2.1 Wastewater Facility

The Bay City Wastewater Treatment Plant (WWTP) was constructed in 1971 as a clay-lined two cell lagoon that utilized a stabilization pond and chlorine disinfection. In 1995, the WWTP was

upgraded after DEQ, and facility personnel determined that effluent from the facultative lagoons installed in 1971 did not consistently meet permit limits.

The current treatment facility is a two-cell sequencing batch reactor (SBR) extended aeration system with an average dry weather design flow of 0.21 mgd and an average wet weather design flow of 0.31 mgd. This system combines biological treatment and sedimentation into a single basin and creates less sludge than other activated sludge systems through the extended aeration process. Raw sewage is pumped by an influent lift station to the treatment plant, where it goes through a mechanical auger, a grinder, and into one of the two SBR basins. Aeration, sedimentation, and clarification are carried out in the same tank within the SBR. Effluent is decanted from the SBR and disinfected by UV radiation prior to being discharged through the outfall to Tillamook Bay.

The outfall extends over 1000 feet from the facility into Tillamook Bay terminating in a single diffuser that is currently inundated with sediment and discharges in a “bubble-up” fashion into adjacent mud-flats.

Waste sludge from the SBRs is pumped to a single-staged aerobic sludge digester basin that utilizes jet aeration. Eventually, sludge is pumped from the digester basin to a facultative sludge lagoon where it is stored until biosolids are removed for landfill disposal. The facultative sludge lagoon can also be used for effluent recirculation if necessary.

If influent flows exceed the capacity of the influent pump station (1.4 mgd), the east lagoon serves as a surge basin and a recirculation pump draws raw wastewater from the surge basin for treatment in the SBR basins. The headworks facility was updated in early 2023 with a new auger for grit removal and an automatic system that pumps effluent to the east lagoon when influent flows exceed the pump station capacity.

Figure 2-1: Facility Location

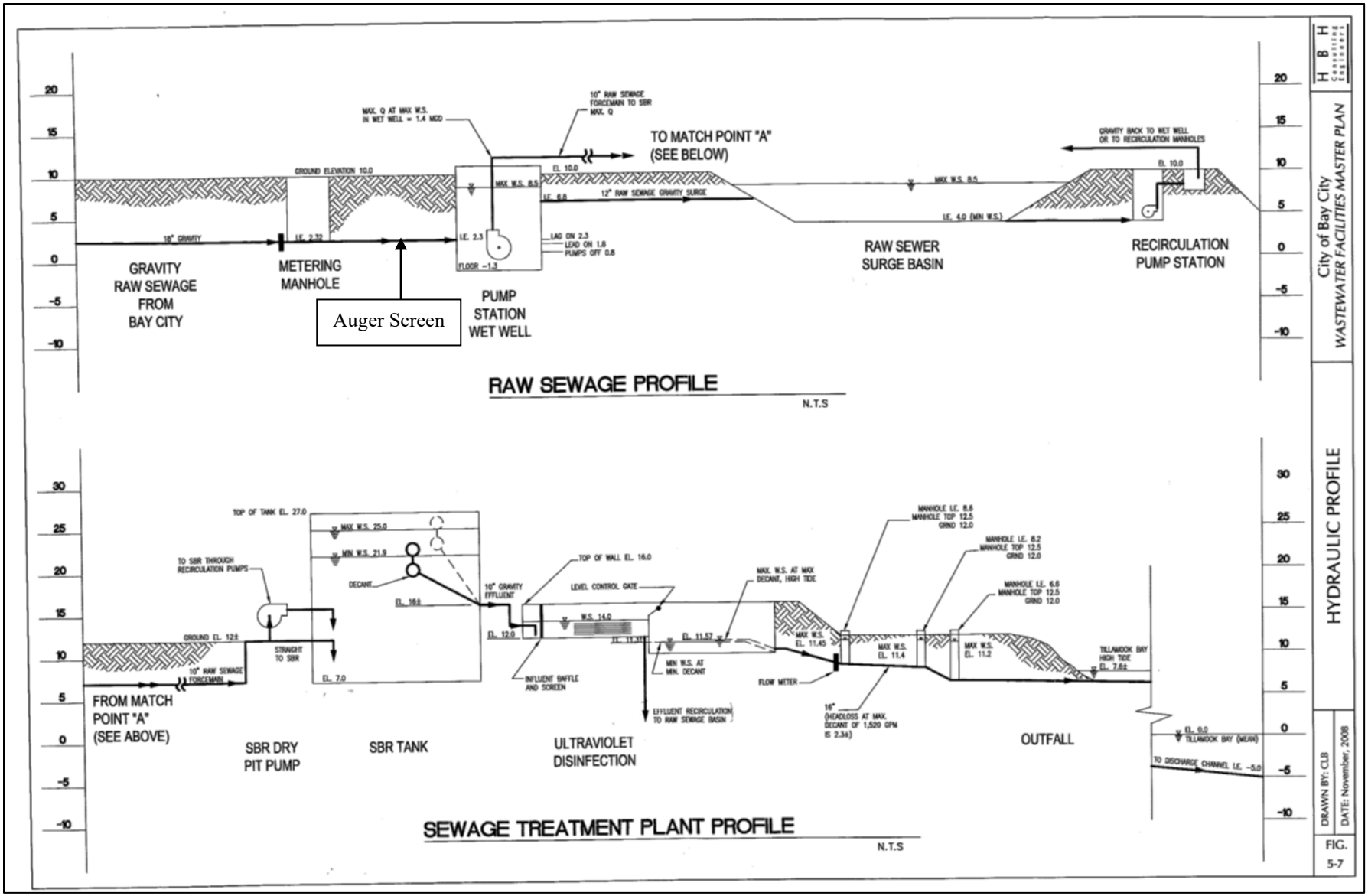

Figure 2-2: Line Drawing of Wastewater Treatment

Table 2-1: List of Outfalls

Outfall Number	Type of Waste	Lat/Long
001	Domestic	45.514735°, -123.891713° (WGS84)

2.2 Stormwater

Stormwater is not addressed in this permit. General NPDES permits for stormwater are not required for facilities with a design flow of less than 1 MGD.

2.3 Industrial Pretreatment

The permittee does not have a DEQ-approved industrial pretreatment program. Based on current information, no industrial pretreatment program is needed. Schedule D of the proposed permit requires the permittee to perform an industrial user survey.

Bay City Ordinance No. 498 authorizes the city to implement an industrial user permitting program for non-residential wastes discharged into the city sewer system. Currently the City has issued one permit to Tillamook Country Smoker with limits for flow, BOD, TSS, pH, and oil and grease. Bay City's industrial user permits are renewed annually.

2.4 Wastewater Classification

OAR 340-049 requires all permitted municipal wastewater collection and treatment facilities receive a classification based on the size and complexity of the systems. DEQ evaluated the classifications for the treatment and collection system, which are publicly available at: https://www.deq.state.or.us/wq/opcert/Docs/OpcertReport.pdf.

3. Schedule A: Effluent Limit Development

Effluent limits serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. Effluent limitations can be based on either the technology available to control the pollutants or limits that are protecting the water quality standards for the receiving water. DEQ refers to these two types of permit limits as technology-based effluent limitations (TBELs) and water quality-based effluent limits (WQBELs) respectively. When a TBEL is not restrictive enough to protect the receiving stream, DEQ must include a WQBEL in the permit.

3.1 Existing Effluent Limits

The table below shows the limits contained in the existing permit.

Table 3-1: Existing Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum (See note a.)
$CBOD_5$ (May 1 – October 31)	mg/L	15	25	-
	lb/day	26	39	52
	% removal	85	-	-
TSS (May 1 – October 31)	mg/L	20	30	-
	lb/day	35	53	70
	% removal	85	-	-
BOD_5 (November 1 – April 30)	mg/L	30	45	-
	lb/day	78	120	160
	% removal	85	-	-
TSS (November 1 – April 30)	mg/L	30	45	-
	lb/day	78	120	160
	% removal	85	-	-
pH	SU	Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 9.0		
Fecal Coliform Bacteria	#/100 mL	Must not exceed a monthly median of 42, not more than 10% of the samples may exceed 129 (See note a.)		
Enterococcus Bacteria	#/100 mL	Must not exceed a monthly geometric mean of 35, not more than 10% of the samples may exceed 130		

Note:

a. If a single sample exceeds 129 organisms per 100 mL, the permittee must evaluate the previous nine sample results to determine if the 10% requirement has been met. If the previous nine samples were all below 129 organisms per 100 mL, the effluent limit has not been exceeded.

3.2 Technology-Based Effluent Limit Development

40 CFR 122.44(a)(1) requires publicly owned treatment works (POTW) to meet technology-based effluent limits, for five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH (i.e., federal secondary treatment standards). Substitution of 5-day carbonaceous oxygen demand ($CBOD_5$) for BOD_5 is allowed. The numeric standards for these pollutants are contained in 40 CFR 133.102. In addition, DEQ has developed minimum design criteria for BOD_5 and TSS that apply to specific watershed basins in Oregon. These are listed in the basin-specific criteria sections under OAR 340-041-0101 to 0350. During the summer low flow months as defined by OAR, these design criteria are more stringent than the federal secondary treatment standards. The basin-specific criteria are not effluent limits but are implemented as design criteria for new or expanded wastewater treatment plants. The table below shows a comparison of the federal secondary treatment standards and the basin-specific design criteria for the North Coast basin.

Table 3-2: Comparison of TBELs for Federal Secondary Treatment Standards and Oregon Basin-Specific Design Criteria

Parameter	Federal Secondary Treatment Standards		North Coast Basin-Specific Design Criteria (OAR 340-041-0235)
	30-Day Average	7-Day Average	Monthly Average
BOD_5 (mg/L)	30	45	May 1 to Oct 31: 20 mg/L, Nov 1 to Apr 30: secondary treatment (same as federal)
$CBOD_5$ (mg/L)	25	40	
TSS (mg/L)	30	45	May 1 to Oct 31: 20 mg/L, Nov 1 to Apr 30: secondary treatment (same as federal)
pH (S.U.)	6.0 – 9.0. (instantaneous)		Not applicable
BOD_5, $CBOD_5$ and TSS % Removal	85%	Not applicable	Not applicable

The limits for BOD_5 and TSS shown in the table above are concentration-based limits. Mass-based limits are required in addition to the concentration-based limits per OAR 340-041-0061(9). For any new facility or any facility that has expanded its dry weather treatment capacity after June 30, 1992, OAR 340-041-0061(9)(b) requires that the mass load limits be calculated based on the proposed treatment facility capabilities and the highest and best practicable treatment to minimize the discharge of pollutants. The permittee's facility has been engineered to achieve monthly average concentrations of 15 mg/L $CBOD_5$ and 20 mg/L TSS during the dry weather season and 30 mg/L BOD_5 and TSS during the wet weather season. DEQ uses the average design flow to calculate the mass load limits as shown below for the dry and wet weather seasons.

Monthly Avg Mass Load = Design Flow* x Monthly Concentration Limit x Unit Conversion factor

Weekly Average Mass Load = 1.5 x Monthly Average Mass Load Limit

Daily Maximum Mass Load = 2 x Monthly Average Mass Load Limit

* Design flow is the design average dry weather flow (DADWF) or design average wet weather flow (DAWWF)

The following table lists the effluent flows and concentration limits used for the calculations.

Table 3-3: Design Flows and Concentrations Limits

Season	Design Flow (mgd)	Monthly TSS Concentration Limit (mg/L)	Monthly $CBOD_5/BOD_5$ Concentration Limit (mg/L)
Dry Weather	0.21	20	15 ($CBOD_5$)
Wet Weather	0.31	30	30 (BOD_5)
Design flow comments: Design average dry weather flow (DADWF) and design average wet weather flow (DAWWF)			

Dry Weather $CBOD_5$ Mass Load Calculations:

Monthly Average: 0.21 mgd x 15 mg/L x 8.34 = 26 lbs/day (two significant figures)

Weekly Average: 26 lbs/day monthly average x 1.5 = 39 lbs/day

Daily Maximum: 26 lbs/day monthly average x 2 = 52 lbs/day

Dry Weather TSS Mass Load Calculations:

Monthly Average: 0.21 mgd x 20 mg/L x 8.34 = 35 lbs/day (two significant figures)

Weekly Average: 35 lbs/day monthly average x 1.5 = 53 lbs/day (two significant figures)

Daily Maximum: 35 lbs/day monthly average x 2 = 70 lbs/day

Wet Weather BOD_5 and TSS Mass Load Calculations:

Monthly Average: 0.31 mgd x 30 mg/L x 8.34 = 78 lbs/day (two significant figures)

Weekly Average: 78 lbs/day monthly average x 1.5 = 120 lbs/day (two significant figures)

Daily Maximum: 78 lbs/day monthly average x 2 = 160 lbs/day (two significant figures)

The proposed $CBOD_5/BOD_5$ and TSS limits are listed in the following table.

Table 3-4: $CBOD_5/BOD_5$ and TSS Technology Based Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
$CBOD_5$ (May 1 – October 31)	mg/L	15	25	-
	lbs/day	26	39	52
	% removal	85	NA	NA

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
TSS (May 1 – October 31)	mg/L	20	30	-
	lbs/day	35	53	70
	% removal	85	-	-
BOD_5 (November 1 – April 30)	mg/L	30	45	-
	lbs/day	78	120	160
	% removal	85	-	-
TSS (November 1 – April 30)	mg/L	30	45	-
	lbs/day	78	120	160
	% removal	85	-	-

3.3 Water Quality-Based Effluent Limit Development

40 CFR 122.44(d) requires that permits include limitations more stringent than technology-based requirements where necessary to meet water quality standards. Water quality-based effluent limits may be in the form of a wasteload allocation required as part of a Total Maximum Daily Load (TMDL). They may also be required if a site-specific analysis indicates the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality criterion. DEQ establishes effluent limits for pollutants that have a reasonable potential to exceed a criterion. The analyses are discussed below.

3.3.1 Designated Beneficial Uses

NPDES permits issued by DEQ must protect the following designated beneficial uses of Tillamook Bay. These uses are listed in OAR-340-041-0230 for the North Coast basin.

- Industrial water supply
- Fish and aquatic life (including salmonid rearing and migration)
- Wildlife and hunting
- Fishing
- Boating
- Water contact recreation
- Aesthetic quality
- Commercial navigation and transportation

3.3.2 303(d) Listed Parameters and Total Maximum Daily Loads

The following table lists the parameters that are on the 2022 303(d) list (Category 5) within the discharge's stream reach. The table also lists any parameters with a TMDL wasteload allocation assigned to the facility (Category 4).

Table 3-5: 303(d) and TMDL Parameters

Water Quality Limited Parameters (Category 5)	
AU ID:	OR_EB_1710020308_01_100298
AU Name:	Tillamook Bay
AU Status:	Impaired
Year Listed	2002
Year Last Assessed	2022
303d Parameters (Category 5)	pH*, Enterococci, Arsenic – Inorganic
TMDL Parameters (Category 4)	
E. coli, Fecal Coliform, Temperature**	

*Assessment Unit ID OR_EB_1710020308_01_100298 – Tillamook Bay was incorrectly listed as impaired for pH in the 2022 Integrated Report. DEQ will be pursuing delisting for this AU for pH in the 2024 Integrated Report cycle with a delisting reason of "Applicable WQS attained; original basis for listing was incorrect". The 2022 pH 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU. See Appendix A for more information.

**Assessment Unit ID OR_EB_1710020308_01_100298 – Tillamook Bay was incorrectly listed as impaired for temperature in the 2018/2020 and 2022 Integrated Reports. DEQ will be pursuing delisting for this AU for temperature in the 2024 Integrated Report cycle with a delisting reason of "Applicable WQS attained; original basis for listing was incorrect". The 2022 temperature 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU. See Appendix B for more information.

DEQ has not developed TMDLs for enterococci or arsenic in Tillamook Bay. The enterococci and arsenic listings are addressed in sections 3.3.9, and 3.3.10, respectively.

3.3.3 TMDL Wasteload Allocations

DEQ issued a TMDL for the Tillamook Bay Watershed in 2001. Primary parameters of concern in the 2001 TMDL were temperature and bacteria. WLAs from this TMDL that are applicable to the permittees are listed in the following table.

Table 3-6: Applicable WLAs

Parameter	WLA	Time Period
Bacteria (Fecal Coliform)	Must not exceed a monthly geometric mean of 42 organisms per 100 mL. No more than 10 percent of the samples may exceed 129 organisms per 100 mL.	Year round

The fecal coliform WLA is discussed in section 3.3.9. Tillamook Bay was not water quality limited for temperature in 2001, so a WLA was not developed for Bay City WWTP.

3.3.4 Ocean Discharge Findings

Federal rules (40 CFR §125.120 – 40 CFR §125.124) require that a discharge into territorial seas that is to be permitted under the NPDES program be evaluated as to whether the discharge will cause unreasonable degradation of the marine environment. Goals 6 and 19 of Oregon's Statewide Planning Goals and Guidelines and Oregon's Territorial Seas Plan require that the State's marine resources be conserved. DEQ believes that the intent of these criteria is to reduce or prevent the discharge of those persistent pollutants that bio-accumulate in the marine food chain. Pollutants found in sewage that are amenable to treatment by typical wastewater treatment facilities include Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), pH, bacteria, nutrients, and potentially toxic substances, such as chlorine, which is used for disinfection of pathogenic organisms.

BOD, TSS, and pH are not discrete substances that can accumulate in living organisms. BOD is a measure of the oxygen used by microorganisms when they break down organic matter. TSS is a measure of organic and inorganic solid materials that are suspended in the water column, and pH is a measure of the amount of hydrogen ions in solution.

Residual chlorine in treated wastewater, if any, immediately reacts with bromide naturally present in seawater to produce other oxidants that are toxic to living organisms. These other oxidants are referred to as chlorine produced oxidants. Chlorine, which is still present in the reaction products, is too reactive to be bioavailable from soil, water, or other environmental media and too reactive to bio-accumulate in the food chain. Bay City, however, uses ultraviolet light for disinfection, and chlorine compounds are prohibited in the discharge.

Bacteria do not bio-accumulate in other living organisms. Nutrients, (e.g., nitrogen and phosphorus), can have deleterious effects on the marine environment by stimulating algal blooms. These algal blooms have the potential to cause turbidity problems and fluctuations in dissolved oxygen and pH. However, nutrients do not bio-accumulate in the tissues of living organisms and do not bio-magnify in the trophic levels of marine food chains.

DEQ has concluded that the discharge from the Bay City wastewater treatment plant will not cause unreasonable degradation of the marine environment.

3.3.5 Pollutants of Concern

To ensure that a permit is protecting water quality, DEQ must identify pollutants of concern. These are pollutants that are expected to be present in the effluent at concentrations that could adversely impact water quality. DEQ uses the following information to identify pollutants of concern:

- Effluent monitoring data.
- Knowledge about the permittee's processes.
- Knowledge about the receiving stream water quality.
- Pollutants identified by applicable federal effluent limitation guidelines.

Based on EPA's NPDES permit application requirements, toxic pollutants of concern for domestic facilities are listed in the following table.

Table 3-7: Domestic Toxic Pollutants of Concern

Flow Rate	Pollutants
< 0.1 mgd	Total Residual Chlorine
≥ 0.1 mgd and < 1.0 mgd	Total Residual Chlorine, Total Ammonia Nitrogen
≥ 1.0 mgd	Total Residual Chlorine, Total Ammonia Nitrogen, Metals, Volatile Organic Compounds, Acid Extractable Compounds, Base Neutral Compounds

DEQ identified the following pollutants of concern for this facility listed in the following table.

Table 3-8: Pollutants of Concern

Pollutant	How was pollutant identified?
pH	Effluent Monitoring
Temperature	Effluent Monitoring
Fecal Coliform	Effluent Monitoring
Enterococcus	Effluent Monitoring
Total Ammonia Nitrogen	Application Requirement

The sections below discuss the analyses that were conducted for the pollutants of concern to determine if water quality based effluent limits are needed to meet water quality standards.

3.3.6 Regulatory Mixing Zone

The proposed permit contains a mixing zone as allowed per OAR 340-041-0053. The regulatory mixing zone from the existing permit is described as:

> *The allowable mixing zone must consist of that portion of the Tillamook Bay within a 50-foot radius from the point of discharge. The zone of initial dilution is that part of the mixing zone within a 5-foot radius from the point of discharge.*

The proposed permit contains an updated regulatory mixing zone description which is described as follows. The previous permits included a condition at which the permittee could only discharge when the outfall was under 2 feet of water. The facility cannot meet that condition. So, alternative mixing zone modeling was conducted for the current discharge scenario at the facility. As a result, the mixing zone description was updated to:

> *The Regulatory Mixing Zone (RMZ) is the portion of Tillamook Bay in 50 feet from all directions from each diffuser. The Zone of Initial Dilution (ZID) is that part of the mixing zone within a 5-foot radius from the point of discharge.*

The current outfall is located approximately 2,000 feet north of Goose Point on the east side of Tillamook Bay. The outfall pipe extends from the eastern shoreline into the Bay, situated in what was once a shallow channel, serving Doty Creek. The Doty Creek channel, when the outfall was planned and installed, was approximately 2-3 feet deep at Mean Low Water. Storm events within

the area have relocated that channel closer to the shoreline and the outfall diffuser is currently inundated with sediment and discharges in a “bubble-up” fashion into adjacent mud-flats. The current outfall replaced an older outfall in 1995. The previous outfall was designed as a diffuser with two 8-inch diameter ports spaced 18 ft apart and had coordinates of 45.514686°, -123.889441° at the north diffuser and 45.514628°, -123.889436° at the south diffuser. This outfall was retired after the new outfall, was put into service in 1995. The new outfall is located at 45.514735°, -123.891713°. All coordinates are in WGS 1984.

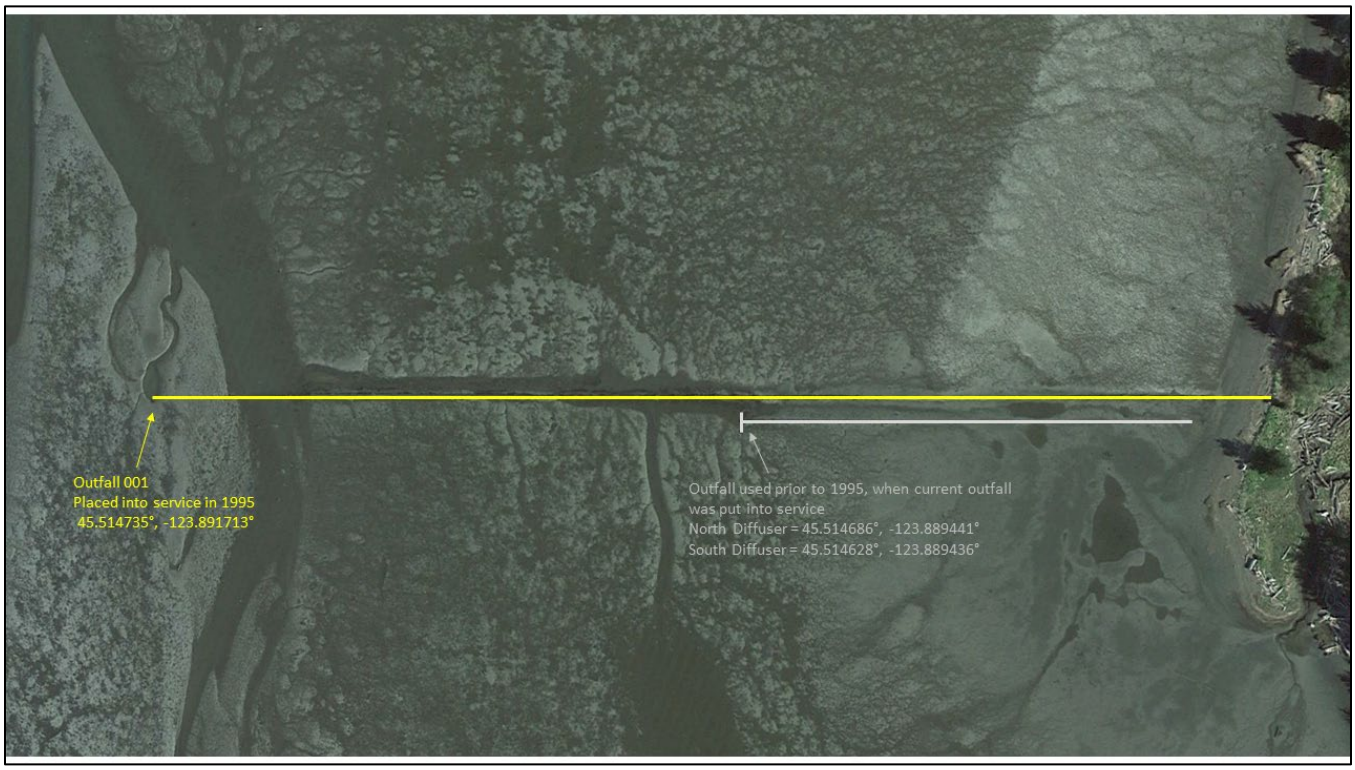

Figure 3-1: Outfall Location

A NOAA CO-OPS station is located in the bay – 9437540 Garibaldi. MLLW at the site is 3.99 feet above the station datum. A mixing zone study conducted in 1989 reported the outfall is located at -2.5 ft MSL. MSL is located at 8.49 feet above the station datum, which means the outfall is located at 5.99 feet above the station datum. From that information, DEQ concludes that the outfall is located at 2 feet above MLLW.

Aquatic Life Criteria developed by EPA indicate a time period over which exposure to a pollutant is meant to be averaged, and an upper limit on the average concentration, thereby limiting the duration of exposure to elevated concentrations. For acute criteria, EPA recommends an averaging period of 1 hour. That is; to protect against acute effects, the 1-hour average exposure should not exceed the Criterion Maximum Concentration (CMC). For chronic criteria, EPA recommends an averaging period of 4 days. That is, the 4-day average exposure should not exceed the Criterion Continuous Concentration (CCC) (United States Environmental Protection Agency, Aug 1994).

A review of tidal data between 2019 and 2023 shows a low tide event on 12/6/2021 where the tide dipped below 2 feet above MLLW (the estimated outfall elevation) for 336 minutes (5.6 hours) between 12/6/2021 at 1:00pm and 12/6/2021 at 6:36pm. As a result, the outfall is likely above the water level for 5-6 hours at a time during extreme low tide events.

Because the outfall is exposed at MLLW for more than 1 hour, and that condition is representative of the duration of the acute aquatic life criteria, no dilution at the ZID will be assigned. A dilution of 1 will be used for all acute aquatic life criteria reasonable potential analysis in the permit renewal.

DEQ's Mixing Zone IMD recommends evaluating Chronic Aquatic Life criteria at MLLW. However, in this particular case, MLLW would not occur over a 4-day period. As a result, a more reasonable low water height for the outfall for a 4-day average period would be the Mean Tide Level (MTL), which is the arithmetic mean of mean high water and mean low water (NOAA, 2024). The MTL is 8.48 above the datum. The outfall is located at 5.99 feet above the station datum. As a result, the Mean Tide Level (MTL) is 2.49 feet above the outfall elevation. Mixing zone modeling for this Mean Tide Level scenario (for Chronic Aquatic Life and Human Health) was conducted using CORMIX 12.0.1.0. Dilutions are in Table 3-9. An April 16, 2024 memo containing this analysis is included in the administrative record.

Table 3-9: Dilutions for Outfall 001

Dilution Summary – Outfall 001 – Year-Round						
Water Quality Standard	**Critical Velocity (m/s)**		**Effluent Flow (mgd)**		**Dilution Factor**	**Location**
	Statistic	**Velocity**	**Statistic**	**Flow**		
Aquatic Life, Acute	N/A	N/A	☐ ADWDF x PF ☐ Max Daily Avg ☒ Other: N/A	N/A	1	ZID (5 ft)
Aquatic Life, Chronic	10th percentile	0.1	☐ ADWDF ☒ Max Monthly Avg ☐ Other	0.825	3.2	RMZ (50 ft)
Human Health, Non-Carcinogen	50th percentile	0.5	☐ ADWDF ☒ Max Monthly Avg ☐ Other	0.825	9.1	RMZ (50 ft)
Human Health, Carcinogen	50th percentile	0.5	☐ Annual Avg Design ☐ Annual Avg ☒ Other: Max Monthly Average	0.825	9.1	RMZ (50 ft)
ADWDF = Average dry weather design flow *PF = Peaking factor (1.5)*						

3.3.7 pH

The pH criterion for this basin is 6.5 – 8.5 per OAR 340-041-0235. DEQ determined there is reasonable potential for the discharge to exceed the existing lower pH effluent limit (6.0) at the edge of the mixing zone. The proposed lower pH limit is 6.4 which is a WQBEL. The upper pH limit is 9.0 and is a TBEL. The following table provides a summary of the data used for the analysis.

Table 3-10: pH Reasonable Potential Analysis

Input	Lower pH Criteria	Upper pH Criteria
1. Discharge area characteristics		
a. Dilution at mixing zone boundary	3.2	3.2
b. Depth of discharge (m)	0.76	0.76
2. Upstream characteristics		
a. Temperature (°C)	15.0	9.1
b. pH (S.U)	7.8	8.2
c. Alkalinity (mg $CaCO_3$/L)	43.6	43.6
d. Salinity (psu)	32.6	32.6
3. Effluent characteristics		
a. Temperature (°C)	16.0	11.1
b. pH (S.U.)	6.0	9.0
c. Alkalinity (mg $CaCO_3$/L)	134.6	134.6
d. Salinity (psu)	0.1	0.1
4. Applicable pH criteria	6.5	8.5
pH at mixing zone boundary	**6.0**	**8.5**
Is there reasonable potential?	**Yes**	**No**
Proposed effluent limits	**6.4**	**9.0**
Effluent data source: DMRs: 11/1/2019 - 03/31/2024 Default effluent alkalinity and salinity values were used.		
Ambient data source: AWQMS: 5/18/2015 - 10/7/2020 from ORDEQ stations 13308, 38598 and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity is the average salinity from stations and dates above.		

pH discharge monitoring data between November 2019 and March 2024 were compared against proposed limits in the figure below.

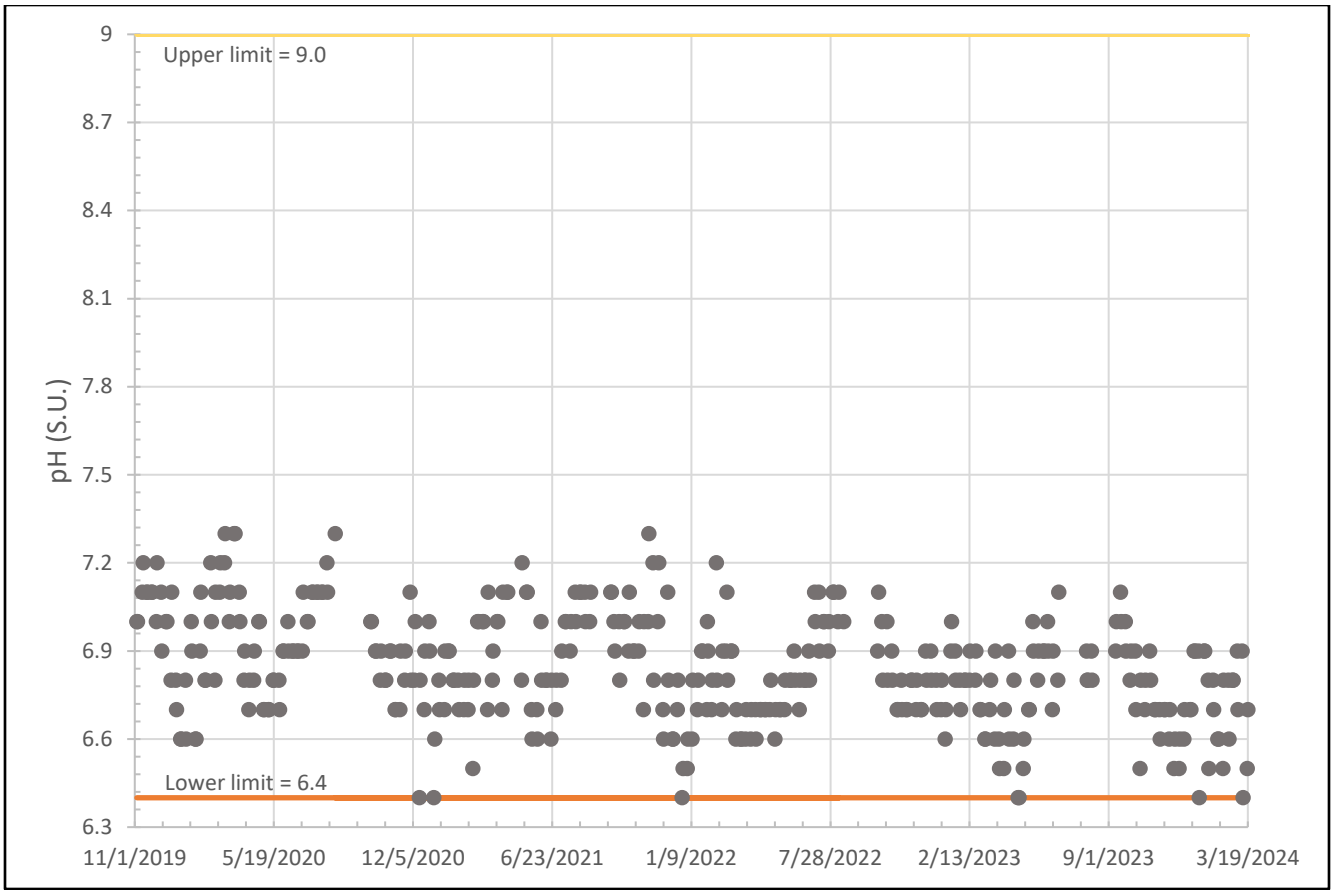

Figure 3-2: pH Monitoring Data vs Proposed Limits

From November 2019 to March 2024, the maximum daily pH value was 7.3, while the minimum pH daily value was 6.4. The permittee will have to adjust facility operations to meet other effluent limits. As a result, the permittee will not be able to be able to meet the lower pH limit upon issuance. A compliance schedule has been added to the proposed permit (see Schedule C of Fact Sheet and Permit).

3.3.8 Temperature

3.3.8.1 Temperature Criteria OAR 340-041-0028

The following table summarizes the temperature criteria that apply at the discharge location along with whether the receiving stream is water quality-limited for temperature and whether a TMDL wasteload allocation has been assigned. Using this information, DEQ performed several analyses to determine if effluent limits were needed to comply with the temperature criteria.

Table 3-11: Temperature Criteria Information

Applicable Temperature Criterion	Oceans & Bays (340-041-0028(7))
Applicable dates: Year-round	
Salmon/Steelhead Spawning 13 °C? OAR 340-041-0028(4)(a)	☐Yes ☒No
Applicable dates: NA	
WQ-limited?	☐Yes ☒No
TMDL wasteload allocation assigned?	☐Yes ☒No
Applicable dates: NA	
TMDL based on natural conditions criterion?	☐Yes ☒No
Cold water summer protection criterion applies?	☐Yes ☒No
Cold water spawning protection applies?	☐Yes ☒No
Comments:	

Ocean and bay waters may not be warmed by more than 0.3 °C (0.5 °F) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Based on consultation with ODFW and ODA, DEQ determined salmonid rearing and migration to be the most sensitive beneficial use in the Mainstem Lower Tillamook Bay assessment unit. Because an adverse effect to fish or other aquatic life is not reasonably expected, DEQ performed a temperature reasonable potential analysis for year-round rearing and migration. The criterion is 18 ºC. The effluent temperature value used in this analysis is 22 °C and represents the maximum 7-day average of the daily maximum effluent temperatures. The ambient temperature value used in this analysis is 13 °C and represents the average 7-day average of the daily maximum ambient temperatures. The results of this analysis indicate that there is no potential for the facility's discharge to exceed the temperature standard (see Appendix C).

Based on this analysis, no temperature limit associated with the applicable temperature criteria is included in the proposed permit.

Final effluent limits are listed in the following table.

Table 3-122: Temperature Criterion Effluent Limits

Effluent limit needed? ☐Yes ☒No
TMDL WLA Limit: NA
Applicable time period: Dates ☒NA
Temperature Criterion Limit: NA
Applicable time period: Year round ☒NA
Comments:

3.3.8.2 Thermal Plume OAR 340-041-0053(2)(d)

In addition to compliance with the temperature criteria, OAR 340-041-0053(2)(d) contains thermal plume limitation provisions designed to prevent or minimize adverse effects to salmonids that may result from thermal plumes. The discharge was evaluated for compliance with these provisions as follows:

- OAR 340-041-0053(2)(d)(A): Impairment of an active salmonid spawning area where spawning redds are located or likely to be located. This adverse effect is prevented or minimized by limiting potential fish exposure to temperatures of 13 ºC or more for salmon and steelhead, and 9 ºC or more for bull trout.

  Tillamook Bay is not designated as salmonid spawning habitat; therefore, the spawning area requirement is met.

- OAR 340-041-0053(2)(d)(B): Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32 ºC or more to less than 2 seconds.

  The maximum daily effluent temperature recorded between May 2020 and October 2023 was 22 °C, below the criterion of 32 °C. Therefore, the discharge is not expected to cause acute impairment to salmonid species.

- OAR 340-041-0053(2)(d)(C): Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25 ºC or more to less than 5% of the cross-section of 100% of the 7Q10 flow of the water body.

  The maximum daily effluent temperature recorded between May 2020 and October 2023 was 22 °C. Since the maximum effluent temperature is below 25 °C, thermal shock caused by the discharge is prevented or minimized.

- OAR 340-041-0053(2)(d)(D): Unless ambient temperature is 21 ºC or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21 ºC or more to less than 25% of the cross-section of 100% of the 7Q10 flow of the water body.

  An analysis related to migration blockage, included in Appendix D, indicates that when the effluent plume reaches 25% of the receiving stream's cross-sectional area, the plume's temperature will not be above 21.0 °C, and migration blockage caused by the discharge is therefore prevented or minimized.

Effluent limits needed to comply with the thermal plume requirements are shown in the following table.

Table 3-13: Thermal Plume Effluent Limit

Effluent limit needed? ☐Yes ☒No
Calculated limit: NA
Applicable timeframe: NA
Comments: NA

3.3.9 Bacteria

Enterococcus

OAR 340-041-0009(6)(a) requires discharges of bacteria into coastal waters meet a monthly geometric mean of 35 enterococcus organisms per 100 mL, with no more than 10 percent of samples exceeding 130 enterococcus organisms per 100 mL. The following table includes the proposed permit limits and apply year-round.

Table 3-14: Proposed Enterococcus Limits

Enterococcus (#/100 ml)	Geometric Mean	No more than 10% exceed
Existing Limit	35	130
Proposed Limit	35	130

Fecal Coliform

The current permit contains limits for fecal coliform based on the 2001 TMDL. This TMDL addressed the fecal coliform water quality standard that was in place at the time of TMDL development. The fecal coliform standard has since been updated, and now includes a figure (OAR 340-041-0230, Figure 230E) that delineates locations in Tillamook Bay where coastal contact recreation and shellfish harvesting are designated beneficial uses. The locations for the shellfish harvesting use differ from those considered under the TMDL. Because of this difference, the TMDL wasteload allocation cannot be solely relied on to ensure compliance with the fecal coliform criteria at the designated shellfish harvesting location.

DEQ conducted a new analysis and determined that more stringent fecal coliform limits are required to ensure compliance with the fecal coliform water quality criteria (see Appendix E). The limits for fecal coliform are year-round and are included in the table below. The statistics used for limit compliance have changed to align with the applicable rule.

Table 3-15: Proposed Fecal Coliform Limits

Discharge Period	Fecal Coliform (#/100 ml)	
	Monthly Median	Not More than 10% of the Samples May Exceed
May 1 – October 31	14	43
November 1 – April 30	14	43

Fecal coliform discharge monitoring data between November 2019 and March 2024 were compared against proposed limits in the figure below.

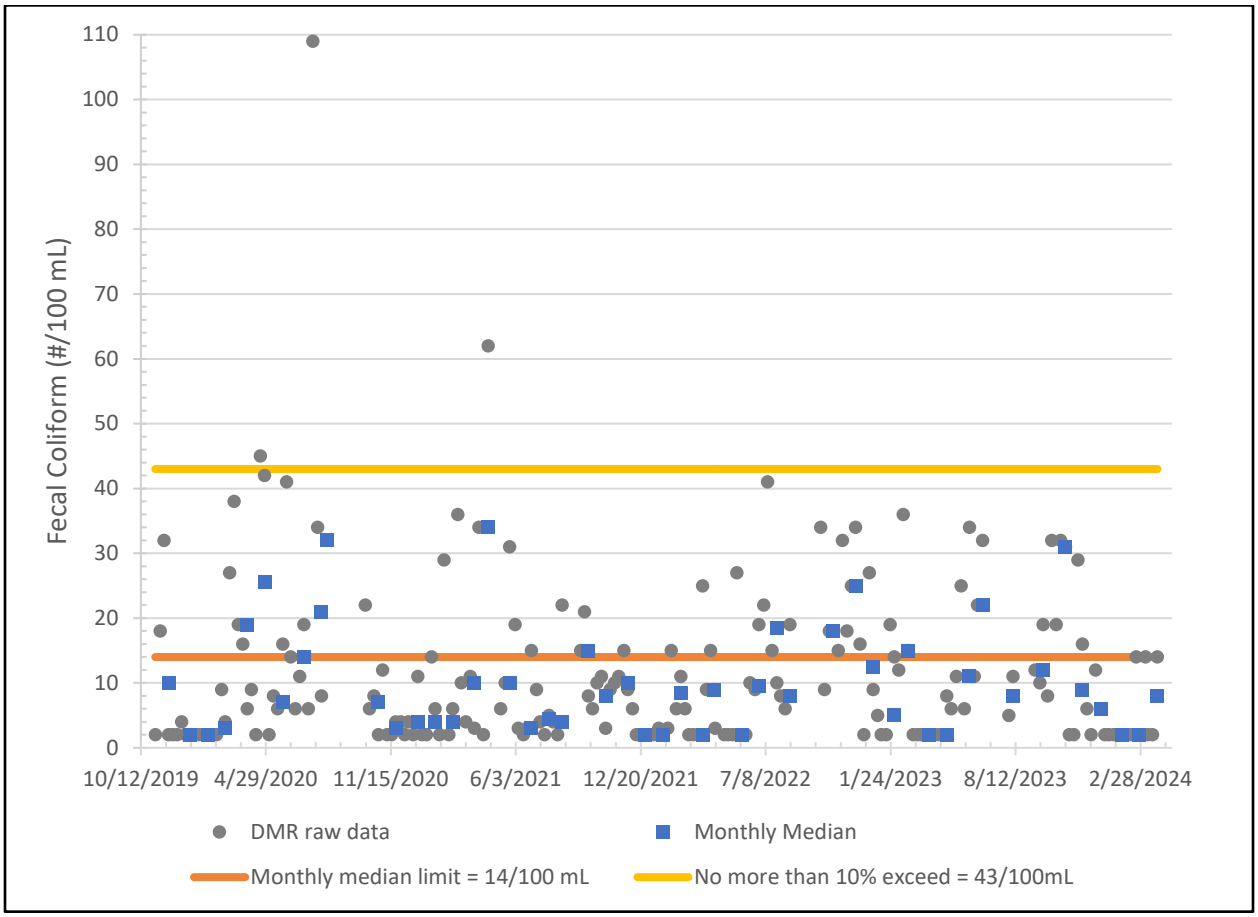

Figure 3-3: Fecal Coliform Monitoring Data vs Proposed Limits

The proposed monthly median limit is outside of the range currently achieved by the facility. A compliance schedule has been added to the proposed permit (see Schedule C of Fact Sheet and Permit).

3.3.10 Toxic Pollutants

DEQ typically performs the reasonable potential analysis for toxics according to EPA guidance provided in the Technical Support Document for Water Quality-Based Toxics Control (TSD) (Office of Water Enforcement and Permits, U.S. EPA, March 1991). The factors incorporated into this analysis include:

1. Effluent concentrations and variability
2. Water quality criteria for aquatic life and human health
3. Receiving water concentrations
4. Receiving water dilution (if applicable)

DEQ performs these analyses using spreadsheets that incorporate EPA's statistical methodology. The following sections describe the analyses for various toxic pollutants below.

3.3.10.1 Total Ammonia Nitrogen

DEQ's ammonia criteria vary with changes in pH and temperature. DEQ performed a reasonable potential analysis that accounts for changes in the effluent and receiving water pH and temperature to determine the appropriate ammonia criteria.

Ammonia reasonable potential analyses were performed for summer (May 1 – October 31) and winter (November 1 – April 30). The results of the summer and winter analyses show that there is reasonable potential to exceed water quality criterion at the edge of the ZID or the RMZ for the chronic (7Q10) ammonia saltwater criteria.

Bay City WWTP currently does not have ammonia limits, but because of the reasonable potential found for the summer and winter periods, new effluent limits are included in the proposed permit. These new ammonia limits will be an average monthly limit (AML) of 4.1 mg/L and a maximum daily limit (MDL) of 12.1 mg/L from May 1 to October 31 and an AML of 8.8 mg/L and an MDL of 25.9 mg/L from November 1 to April 30.

Ammonia discharge monitoring data between November 2019 and March 2024 were compared against proposed limits in the figure below.

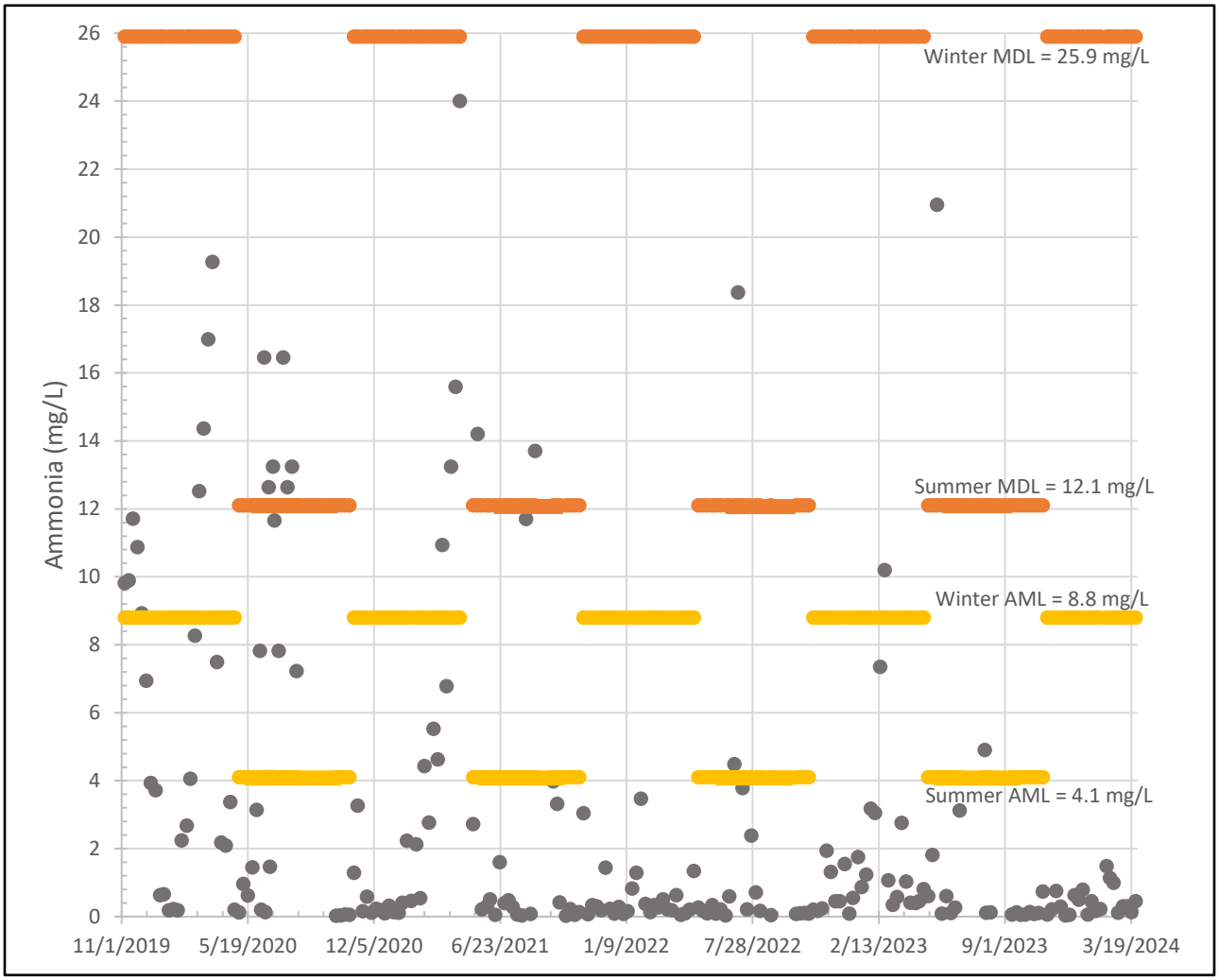

Figure 3-4: Ammonia Monitoring Data vs Proposed Limits

The proposed limits are outside of the range currently achieved by the facility. A compliance schedule has been added to the proposed permit (see Schedule C of Fact Sheet and Permit).

The following tables provide a summary of the data used for the ammonia analyses and the results of the analyses.

Table 3-16: Ammonia Analysis Information - Summer

	Acute	Chronic	
		4-day	30-day
Dilution	1	3.2	9.1
Ammonia Criteria	35.9	2.2	-
Effluent Data Used			
Ammonia (mg/L)	21.0	21.0	
pH (SU)	7.1	7.1	
Temperature (ºC)	21.0	21.0	
Alkalinity (mg/L $CaCO_3$)	64.0	64.0	
Receiving Water Body Data Used			
Ammonia (mg/L)	0.1	0.1	
pH (SU)	8.2	8.2	
Temperature (ºC)	16.1	16.1	
Alkalinity (mg/L $CaCO_3$)	108.0	108.0	
Ammonia Limit Needed?	**Yes**		
Calculated Limits	**AML**	**MDL**	
Ammonia (mg/L)	4.1	12.1	
Effluent data source			
DMRs: 11/1/2019 - 03/31/2024 Default effluent alkalinity and salinity values were used.			
Ambient data source			
AWQMS: 5/18/2015 - 10/7/2021 from ORDEQ stations 13308, 38598 and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity is the average salinity from stations and dates above.			

Table 3-17: Ammonia Analysis Information - Winter

	Acute	Chronic	
		4-day	30-day
Dilution	1	3.2	9.1
Ammonia Criteria	56.0	4.5	-
Effluent Data Used			
Ammonia (mg/L)	24.0	24.0	
pH (SU)	7.1	7.1	
Temperature (ºC)	15.0	15.0	
Alkalinity (mg/L $CaCO_3$)	64.0	64.0	
Receiving Water Body Data Used			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	8.2	8.2	
Temperature (ºC)	11.4	11.4	
Alkalinity (mg/L $CaCO_3$)	55.1	55.1	
Ammonia Limit Needed?	**Yes**		
Calculated Limits	**AML**	**MDL**	
Ammonia (mg/L)	8.8	25.9	
Effluent data source			
DMRs: 11/1/2019 - 03/31/2024 Default effluent alkalinity and salinity values were used.			
Ambient data source			
AWQMS: 5/18/2015 - 10/7/2021 from ORDEQ stations 13308, 38598, and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity is the average salinity from stations and dates above.			

3.3.10.2 Priority Pollutant Toxics

The City of Bay City's WWTP discharges less than 1 MGD and no priority pollutant toxics are known to be present in the discharge. Therefore, no additional controls or monitoring will be required.

3.3.10.3 Other Pollutants Associated with Water Quality Impairments

This assessment unit is listed for Arsenic in Category 5 for not meeting human health criterion for arsenic. Monitoring is required for facilities where the pollutant is known to be present. Arsenic is not known or expected to be present in the facility discharge. Therefore, there is no reasonable potential to cause or contribute to this listing and monitoring for arsenic is not being required in the proposed permit.

3.3.10.4 Mercury – Human Health Criterion

DEQ determined that this facility is not a likely source of mercury. Therefore, no additional controls or monitoring will be required.

3.4 Antibacksliding

The proposed permit complies with the antibacksliding provisions of CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l). The proposed limits are the same or more stringent than the existing permit so the antibacksliding provision is satisfied.

3.5 Antidegradation

DEQ must ensure the permit complies with Oregon's antidegradation policy found in OAR 340-041-0004. This policy is designed to protect water quality by limiting unnecessary degradation from new or increased sources of pollution.

DEQ has performed an antidegradation review for this discharge. The proposed permit contains the same or more stringent discharge loadings as the existing permit. Permit renewals with the same or more stringent discharge loadings as the previous permit are not considered to lower water quality from the existing condition. DEQ is not aware of any information that existing limits are not protecting the receiving stream's designated beneficial uses. DEQ is also not aware of any existing uses present within the water body that are not currently protected by standards developed to protect the designated uses. Therefore, DEQ has determined that the proposed discharge complies with DEQ's antidegradation policy. DEQ's antidegradation worksheet for this permit renewal is available upon request.

3.6 Whole Effluent Toxicity

DEQ does not require whole effluent toxicity testing (WET) for minor domestic facilities because concentrations of toxics are typically very low and WET testing is not warranted.

3.7 Groundwater

The treatment facility does not have any basins, ponds or lagoons that have the potential to leach into the groundwater. No groundwater monitoring or limits are required.

4. Schedule A: Other Limitations

4.1 Mixing Zone

Schedule A describes the regulatory mixing zone as discussed above in section 3.

4.2 Biosolids

The WWTP is currently storing all its wastewater solids in a facultative sludge lagoon at the treatment plant. If during the term of this permit the WWTP decides that its wants to treat and land apply their wastewater solids as biosolids, the facility will need to develop a Biosolids Management Plan. At a minimum, this plan will need to detail that the facility's wastewater solids will meet biosolids pollutant limits defined in OAR 340-050 and 40 CFR Part 503 and will be treated to meet state and federal criteria for pathogen reduction (Class A or Class B biosolids) and vector attraction reduction. The plan will also be subject to public review and comment before it may be implemented.

For all Class B biosolids to be land applied under this permit, Schedule A of the permit requires the facility to apply biosolids according to their Biosolids Management Plan. In addition, Schedule A requires the following:

- The biosolids must be land applied at or below agronomic rates.
- The permittee must have written site authorization for each location from DEQ before land applying and abide by the restrictions for each site.
- Prior to application, the permittee must ensure that biosolids meet one of the pathogen reduction standards under 40 CFR 503.32 and one of the vector attraction reduction standards under 40 CFR 503.33.
- The permittee must not apply biosolids containing pollutants in excess of the ceiling concentrations for the nine metals shown in Schedule A of the permit.

It should be noted that the facility will not need to develop a Biosolids Management Plan for transfer of its wastewater solids or sewage sludge to other DEQ-approved facilities permitted to process, manage, or dispose of these types of residuals.

4.3 Chlorine Usage

Schedule A of the permit prohibits the permittee from using chlorine or chlorine compounds for effluent disinfection purposes.

5. Schedule B: Monitoring and Reporting Requirements

Schedule B of the permit describes the minimum monitoring and reporting necessary to demonstrate compliance with the proposed effluent limits. In addition, monitoring for other parameters is required to better characterize the effluent quality and the receiving stream. This data will be used during the next permit renewal. Detailed monitoring frequency and reporting requirements are in Schedule B of the proposed permit. The required monitoring, reporting and frequency for many of the parameters are based on DEQ's monitoring and reporting matrix guidelines, permit writer judgment, and to ensure the needed data is available for the next permit renewal. The permittee requested monitoring reductions for BOD_5, $CBOD_5$, TSS, enterococcus, and fecal coliform. DEQ reviewed the request using EPA's memo "Interim Guidance for Performance – Based Reductions of NPDES Permit Monitoring Frequencies - April 19, 1996" and found that the permittee was eligible for reductions in BOD_5, $CBOD_5$, and TSS monitoring and adjusted monitoring frequencies accordingly. Due to water quality impairments in the receiving water for bacteria, no reductions in enterococcus or fecal coliform monitoring frequencies were granted. Receiving water body monitoring added this permit renewal includes total ammonia and alkalinity for use in reasonable potential analyses. Both parameters are not routinely monitored by another agency in Tillamook Bay and most of the ambient data currently available will be over 10 years old during the next permit renewal.

6. Schedule C: Compliance Schedule

The proposed permit contains new effluent limits for total ammonia and more restrictive effluent limits for fecal coliform bacteria and pH. The facility is unable to meet these limits upon permit issuance. The proposed permit contains compliance schedules that allow time for the facility to make facility modifications in order to meet the new limits that are more restrictive water quality-based effluent limits (WQBELs) than those in the current permit. These compliance schedules lay out a series of milestones which upon completion, will enable the permittee to meet the permit's WQBELs (see 40 CFR 122.47 and OAR 340-041-0061(12)).

The compliance schedules allow the permittee time to do the following:

- Gather information and prepare optimization studies outlining feasible operational changes that can be made to the current treatment process at the facility to maximize control of fecal coliform bacteria, pH, and total ammonia;
- If needed based on optimization study findings and implementation results, secure adequate funding for developing a draft plan to identify upgrades, design engineering plans, and complete construction of upgraded facilities to meet the fecal coliform, pH, and total ammonia final effluent limits.

With city input, DEQ developed the compliance schedules in the proposed permit to meet the final fecal coliform, pH, and total ammonia limits. Given the complexity of the issues for the overall project and the financial impacts of the project on the city, DEQ considers the proposed schedules to be reasonable, require the final effluent limits to be met as soon as possible, and in compliance with 40 CFR 122.47.

7. Schedule D: Special Conditions

The proposed permit contains the following special conditions:

7.1 Inflow and Infiltration

A requirement to submit an updated inflow and infiltration report in order to reduce groundwater and stormwater from entering the collection system.

7.2 Emergency Response and Public Notification Plan

A requirement to develop and submit an emergency and spill response plan or ensure the existing one is current per General Condition B.8 in Schedule F.

7.3 Exempt Wastewater Reuse at the Treatment System

A condition that exempts the permit holder from the recycled water requirements in OAR 340-055, when recycled water is used for landscape irrigation at the treatment facility or for in-plant processes, such as in plant maintenance activities.

7.4 Wastewater Solids Annual Report

This condition requires the permittee to submit a Wastewater Solids Annual Report each year documenting removal of wastewater solids from the facility during the previous calendar year.

7.5 Biosolids Management Plan

A requirement to manage all biosolids in accordance with a DEQ-approved biosolids management plan and land application plan. The biosolids management plan and the land application plan must meet the requirements in OAR 340-050-0031 and describe where and how the land application of biosolids is managed to protect public health and the environment.

7.6 Wastewater Solids Transfers

A condition that allows the facility to transfer treated or untreated wastewater solids to other in-state or out-of-state facilities that are permitted to accept the wastewater solids.

7.7 Hauled Waste Control Plan

A condition that allows the acceptance of hauled waste according to a DEQ-approved hauled waste plan. The hauled waste plan ensures waste is not accepted that could negatively impact the treatment capabilities of the facility.

7.8 Hauled Waste Annual Report

A condition requiring submittal of an annual hauled waste report that summarizes hauled waste accepted at the facility during the previous year.

7.9 Lagoon Solids

A condition requiring the permittee to submit a sludge depth survey report to ensure lagoon solids are maintained within design standards and accumulations do not negatively affect treatment capabilities.

7.10 Operator Certification

The permit holder is required to have a certified operator consistent with the size and type of treatment plant covered by the permit per OAR 340-049-0005. This special condition describes the requirements relating to operator certification.

7.11 Industrial User Survey

This condition requires the permittee to conduct or update an industrial user survey. The purpose of the survey is to identify whether there are any categorical industrial users discharging to the POTW and ensure regulatory oversight of these discharges.

7.12 Outfall Inspection

A condition that requires the permittee to inspect the outfall and submit a report regarding its condition.

8. Schedule F: NPDES General Conditions

Schedule F contains the following general conditions that apply to all NPDES permittees. These conditions are reviewed by EPA on a regular basis.

- Section A. Standard Conditions
- Section B. Operation and Maintenance of Pollution Controls
- Section C. Monitoring and Records
- Section D. Reporting Requirements
- Section E. Definitions

Appendix A: pH AU Memo

State of Oregon
DEQ Department of Environmental Quality

Memorandum

To: WQ Permit File, 101025 Bay City and 102609 Garibaldi

From: Olivia Stoken, NPDES Permit Writer

Reviewed By: Aliana Britson, Rob Burkhart, George Cannon, and Lesley Merrick

Date: 5/7/2024

Subject: pH 303(d) Listing Discrepancy in Tillamook Bay (Assessment Unit OR_EB_1710020308_01_100298)

Assessment unit (AU) OR_EB_1710020308_01_100298 located in Tillamook Bay was incorrectly added to the 303(d) list as a Category 5 parameter for pH in the 2022 Integrated Report (IR). During the 2022 IR Call for Data, USEPA submitted dissolved oxygen, pH, and temperature data collected at their Garibaldi monitoring location between January 22, 2018 and July 9, 2020. This submission included around 43,000 results per parameter.

Due to an unknown transcription error, the submitted data indicated an impairment of pH for Tillamook Bay. A re-evaluation of the AU with the corrected data resulted in the assessment unit attaining pH water quality standards. Therefore, DEQ will be pursuing delisting for Assessment Unit ID OR_EB_1710020308_01_100298 – Tillamook Bay for pH in the 2024 IR cycle with a delisting reason of "Applicable WQS attained; original basis for listing was incorrect".

Multiple NPDES permittees discharge into this AU, including the City of Bay City (permit # 101025) and the City of Garibaldi (permit # 102609). Since this AU will be delisted for pH in the 2024 IR, the 2022 pH 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU.

Appendix B: Temperature AU Memo

State of Oregon
DEQ Department of Environmental Quality

Memorandum

To: WQ Permit File, 101025 Bay City and 102609 Garibaldi

From: Olivia Stoken, NPDES Permit Writer

Reviewed By: Rob Burkhart, Jeff Navarro, Lesley Merrick, and Travis Pritchard

Date: 5/29/2024

Subject: Temperature 303(d) Listing Discrepancy in Tillamook Bay (Assessment Unit OR_EB_1710020308_01_100298)

Assessment unit (AU) OR_EB_1710020308_01_100298 located in Tillamook Bay was incorrectly added to the 303(d) list as a Category 4A parameter for temperature in the 2018/2020 and 2022 Integrated Reports (IR).

During the 2018/2020 IR, the assessment unit methodology underwent substantial changes resulting in two AUs for Tillamook Bay, the Mainstem Lower (OR_EB_1710020308_01_100298) and the Mainstem Upper (OR_EB_1710020308_01_107225). The Mainstem Upper AU includes portions of major tributaries to Tillamook Bay, which were assessed and listed for temperature in the early 2000s. The temperature assessment and listing for the Miami River was incorrectly carried into the Mainstem Lower Tillamook Bay AU during the 2018/2020 IR methodology change. Therefore, DEQ will be pursuing delisting for Assessment Unit ID OR_EB_1710020308_01_100298 – Lower Mainstem Tillamook Bay for temperature in the 2024 IR cycle with a delisting reason of "Applicable WQS attained; original basis for listing was incorrect".

Multiple NPDES permittees discharge into this AU, including the City of Bay City (permit # 101025) and the City of Garibaldi (permit # 102609). Since this AU will be delisted for temperature in the 2024 IR, the 2022 temperature 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU.

Appendix C: Temperature RPA

Stream Meets Water Quality Criterion (OAR 340-041-0028(4))

For situations where the criterion is met (the waterbody is not listed as impaired for temperature) - Analysis at Edge of Mixing Zone
Section 5.4 of the Temperature IMD

Facility Name: Bay City WWTP **Date:** 5/30/2024
Applicable Criterion and Season: **Rearing and Migration 18 deg C year-round**

Enter data into white cells below:

			Data Metric/Source
Mixing Zone Dilution =	3.2		Aquatic life, chronic year round dilution from mixing zone memo
Ambient Temperature =	13	°C	Average of the 7-day rolling average daily max ambient temperature (2015-2020)
Effluent Temperature =	22	°C	Max of the 7-day rolling average daily max effluent temperature (2019-2024)
Applicable Temperature Criterion =	18	°C	
Effluent Flow =	1.2375	mgd	Max monthly average flow from mixing zone memo x 1.5

ΔT at MZ edge=	**2.8**	**°C**
Temperature at MZ edge=	**15.8**	**°C**

No Reasonable Potential

Thermal Load Limit = N/A Million Kcals (7-day Rolling Avg.)
(relative to the ambient temperature used above)

Note
This thermal load limit is the excess thermal load needed to increase the ambient temperature up to the criterion temperature. However, if the ambient temperature is less than 0.3°C below the criterion, then the thermal load limit is calculated as the excess thermal load necessary to increase the ambient temperature by 0.3°C (as directed by the IMD). Since the Thermal Load Limit above is the excess thermal load above the ambient temperature, compliance is evaluated using the usual equation to determine the actual load discharged, but using the ambient temperature as opposed to the criterion: ETL discharged = $(T_e - T_a)$*Qe*3.78541, where T_e is effluent temperature and T_a is the ambient temperature used above.

Equation used to calculate ΔT at edge of MZ

$$\Delta T_{mz} = \frac{T_e + (S-1)T_a}{S} - T_a$$

Equation used to calculate thermal load limit

$$TLL = 3.78541 Q_e S \Delta T_{all} C_p \rho$$

Where:
Qe = Effluent Flow in mgd
S = Dilution
ΔT_{all} = Allowable temperature increase at edge of MZ (°C)
Cp = Specific Heat of Water (1 cal/g °C)
ρ = Density of Water (1 g/cm^3)
3785.41 = Flow conversion from mgd to m^3/day

Appendix D: Thermal Plume RPA

Temperature Thermal Plume Limitations within the Mixing Zone Rule (OAR 340-041-0053(2)(d))

Sections 5.6 and 6.5 of Temperature IMD

This rule only applies to receiving streams with salmonid uses. For migration blockage, applies to upstream migration of anadromous salmonits (See associated notes in the "Thermal Plumes Instructions".) This spreadsheet assesses compliance with OAR 340-042-0053(2)(d) subparts C and D. Subparts A and B need to be assessed separately (see Thermal Plumes Instructions).

Facility Name: Bay City WWTP **Date: 5/30/2024**

OAR 340-041-0053(2)(d)(C): Thermal Shock 25 deg C at 5% of the stream cross section			OAR 340-041-0053(2)(d)(D): Migration Blockage 21 deg C at 25% of the stream cross section		
Enter data into white cells below:		Data Metric/Source	Enter data into white cells below:		Data Metric/Source
7Q10 =		cfs	7Q10 =	1027.125 cfs	Critical velocity x average depth x distance to nearest bank from mixing zone memo
Ambient Temperature=		ºC	Ambient Temperature =	13 ºC	Average of the 7-day rolling average daily max ambient temperature (2015-2020)
Effluent Flow =		mgd	Effluent Flow =	1.2375 mgd	Max monthly average flow from mixing zone memo x 1.5
Max Daily Effluent Temperature =		ºC	Max 7dAM Effluent Temperature =	22 ºC	Max of the 7-day rolling average daily max effluent temperature (2019-2024)
5% of 7Q10 =	0.0 cfs		25% of 7Q10 =	256.8 cfs	
5% dilution =	#DIV/0!	dilution = (Qr*0.05)/Qe + 1	25% dilution =	135	dilution = (Qr*0.25)/Qe + 1
Temperature at 5% cross section =	**#DIV/0! ºC**		**Temperature at 25% cross section =**	**13.1 ºC**	**No Reasonable Potential**
		#DIV/0!	**ΔT at 25% Stream Flow=**	**0.1 ºC**	

Notes:

Equation used to calculate ΔT at edge of MZ

$$\Delta T_{mz} = \frac{T_e + (S-1)T_a}{S} - T_a$$

Equation used to calculate thermal load limit

$$TLL = 3.7854 Q_e S \Delta T_{all} C_p \rho$$

Where:

Qe = Effluent Flow in mgd
S = Dilution
ΔT_{all} = Allowable temperature increase at edge of MZ (°C)
Cp = Specific Heat of Water (1 cal/g °C)
ρ = Density of Water (1 g/cm^3)
3785.41 = Flow conversion from mgd to m^3/day

Appendix E: Fecal Coliform Bacteria Limit Derivation

Background/General Discussion

The 2001 Tillamook Bay Watershed TMDL included fecal wasteload allocations for Bay City. These allocations addressed the beneficial use of shellfish harvesting within the Tillamook Bay, as designated at the time of TMDL development. At that time there was no specific map within DEQ's water quality rules delineating shellfish harvesting areas. The TMDL determined that conductivity in the bay vs conductivity of saltwater allowed for dilution to be considered in the TMDL wasteload allocation development (see Section 3.2.7 of the TMDL and Appendix B). The TMDL also used estimates of instream and overland bacteria decay (or die off) for riverine discharges in the development of allocations.

In 2016, Oregon's bacteria standards were updated to include figures explicitly delineating shellfish harvesting areas. Specifically, OAR 340-041-0230 Figure 230E was included designating shellfish harvesting areas in the Tillamook Bay. This figure indicates that the designated shellfish harvesting area in the bay is much closer to the mouth of the Trask River (and other rivers) than the location considered during TMDL development.

DEQ would typically rely on TMDL allocations to ensure discharges are not causing or contributing to exceedances criteria. However, because of this change in rule, the allocation to the city may not ensure compliance with the fecal criteria. In particular, the 3 to 1 dilution ratio used in the TMDL for allocation development was reconsidered.

Permit Limit Development

Since OAR 340-041-0230 Figure 230E designates shellfish harvesting as a use within all of Tillamook Bay, the fecal coliform criteria are required to be addressed at this location. These criteria are included in OAR 340-041-009(1)(c) and are a median concentration of 14 organisms per 100 mL and not more than ten percent of the samples may exceed 43 organisms per 100 mL.[1]

As noted above, the TMDL wasteload allocation for Bay City was calculated using the dilution value of 3 to 1 that was expected to occur in the Tillamook Bay and was considered under the TMDL. Since the revised rule designates all of the bay to be shellfish harvesting area, this dilution is no longer considered valid for derivation of Bay City's fecal coliform limits. Where the TMDL targeted fecal coliform values of 42 (14 multiplied by the dilution of 3) and 129 (43 multiplied by the dilution of 3) within the bay, the new permit limits are based on targeting the criteria (14 and 43) within the bay.

[1] The TMDL considered the geometric mean and the 90th percentile statistics as equivalent to the statistics in the rule.