



State of Oregon
Department of
Environmental
Quality

National Pollutant Discharge Elimination System Permit Fact Sheet

City of Tillamook Wastewater Treatment Plant

Final: August 6, 2024

Permittee	City of Tillamook 210 Laurel Avenue Tillamook, Oregon 97141
Existing Permit Information	File Number: 88665 Permit Number: 101239 EPA Reference Number: OR0020664 Category: Domestic Class: Major Expiration Date: November 30, 2023
Permittee Contact	Kenneth Oleman Wastewater Supervisor 503-812-6064 210 Laurel Avenue Tillamook, Oregon 97141
Receiving Water Information	Receiving stream/NHD name: Trask River NHD Reach Code & % along reach: 17100203000108-77.4% USGS 12-digit HUC: 171002030406 OWRD Administrative Basin: North Coast ODEQ LLID & River Mile: 1238814454680 – 1.7 Integrated Report Assessment Unit ID: OR_EB_1710020308_01_107225
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NPDES Permit Fact Sheet

City of Tillamook Wastewater Treatment Plant

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NPDES Permit Renewal Fact Sheet

City of Tillamook Wastewater Treatment Plant

1. Introduction

The Department of Environmental Quality (DEQ) proposes to renew the National Pollutant Discharge Elimination System (NPDES) wastewater permit for the City of Tillamook Wastewater Treatment Plant (WTP) located at 710 5th Street in the City of Tillamook, Tillamook County, Oregon. This permit allows and regulates the discharge of treated wastewater directly to the Trask River at River Mile (RM) 1.7. The permit also authorizes the City of Tillamook to recycle the treated effluent as recycled water to qualified users, after the approval of a Recycled Water Use Plan. Lastly, the permit allows the City of Tillamook to process and apply to land treated liquid biosolids to approved sites in the vicinity of the City of Tillamook, after the approval of a Biosolids Management Plan and Land Application Plan.

The permit and permit fact sheet were initially posted for public comment on DEQ's website on February 15, 2024. The public comment period closed on March 22, 2024. As a result of the comments received during the initial public comment period, DEQ revised several sections of the permit which included more stringent limits for fecal coliform and the incorporation of a compliance schedule. As a result of these permit changes, DEQ concluded that a second public comment period was warranted for this permit.

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

A summary of the major changes to the permit are listed below:

- Schedule A (Waste Discharge Limits) – This schedule has been updated to reflect new permit limits and current DEQ permit format. For example, the permit will include new limits for ammonia and more stringent limits for fecal coliform. In addition, the effluent limitations for Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS) have been corrected slightly to account for DEQ's practice of rounding mass limits to two significant digits. The permittee is also required to prepare a Mercury Minimization Plan.
- Schedule B (Minimum Monitoring and Reporting Requirements) – General monitoring and reporting requirements have been updated to include new summary statistics to be included with web-based electronic Net Discharge Monitoring Reports (NetDMR).

- Schedule C (Compliance Schedule) – A compliance schedule has been added to meet the new ammonia limit.
- Schedule D (Special Conditions) – Several special conditions related to biosolids management and land application, Whole Effluent Toxicity (WET) testing, operator certification and spill/emergency response planning have been updated in this schedule. The requirement to inspect the facility outfall in the next permit term has been moved into this schedule.
- Schedule E (Program Requirements) – There is no pretreatment program associated with this permit.
- Schedule F (General Conditions) – Includes the latest version of the NPDES General Conditions.

2. Facility Description

2.1 Wastewater Facility

The permittee's Tillamook Wastewater Treatment Plant (WTP) is located at 710 5th Street in the City of Tillamook in Tillamook County near the Trask River (Figure 2-1). The permittee completed major upgrades to the WTP in 2010, including a new activated sludge system as well as upgrades to other systems throughout the facility. Major facility improvements included: collection system and pump stations improvements, influent pump station, headworks improvements including an influent screen and bypass channel, selector activated sludge process with anoxic selectors, aeration and channel air blowers, secondary clarifiers with return and waste activated sludge pumping systems, chlorine contact chamber with dual basins and chemical flash mixers, chlorination-dechlorination system, and a reconstructed submerged outfall in the Trask River.

Treated effluent is discharged year-round to the Trask River at approximately RM 1.7.¹ A 2023 capacity evaluation of the facility confirmed an average dry weather design flow of 1.20 million gallons per day (MGD) and an average wet weather design flow of 2.80 MGD.² Actual flows during the 2022 dry season (May 1 – October 31) averaged 0.9 MGD (this includes wet weather flows that occurred in May and June). During the drier months of July through October, effluent flows averaged 0.6 MGD. Effluent flows during the 2022-2023 wet season averaged 2.4 MGD. The facility's peak flow design capacity is 4.0 MGD. The origin of the wastewater processed is approximately 95 percent domestic with the remainder being commercial and light industrial.

¹ This is the distance upstream from the mouth of the Trask River, where it meets Tillamook Bay, based upon DEQ's Geographic Information System (GIS) database. The existing permit lists Outfall 001 at RM 1.9. These river mile determinations are originally upon United States Geological Survey (USGS) mapping. The lower RMs from the DEQ GIS database (1.7) are due to the increased accuracy of the GIS data in comparison to the USGS mapping. The proposed permit will use the DEQ GIS river mile data to be consistent with river mile data being used in other DEQ compliance programs.

² *Capacity Evaluation for the Tillamook Wastewater Treatment Plant*. Table ES-4 Tillamook WTP Description and Design Criteria. Final Report – May 2023.

The permittee reports a current service population of approximately 5,265 residents. Historically the WTP has accepted hauled wastes; however, the permittee has indicated that hauled wastes from the public will no longer be accepted. Future acceptance of hauled waste shall be subject to a DEQ-approved hauled waste control plan.

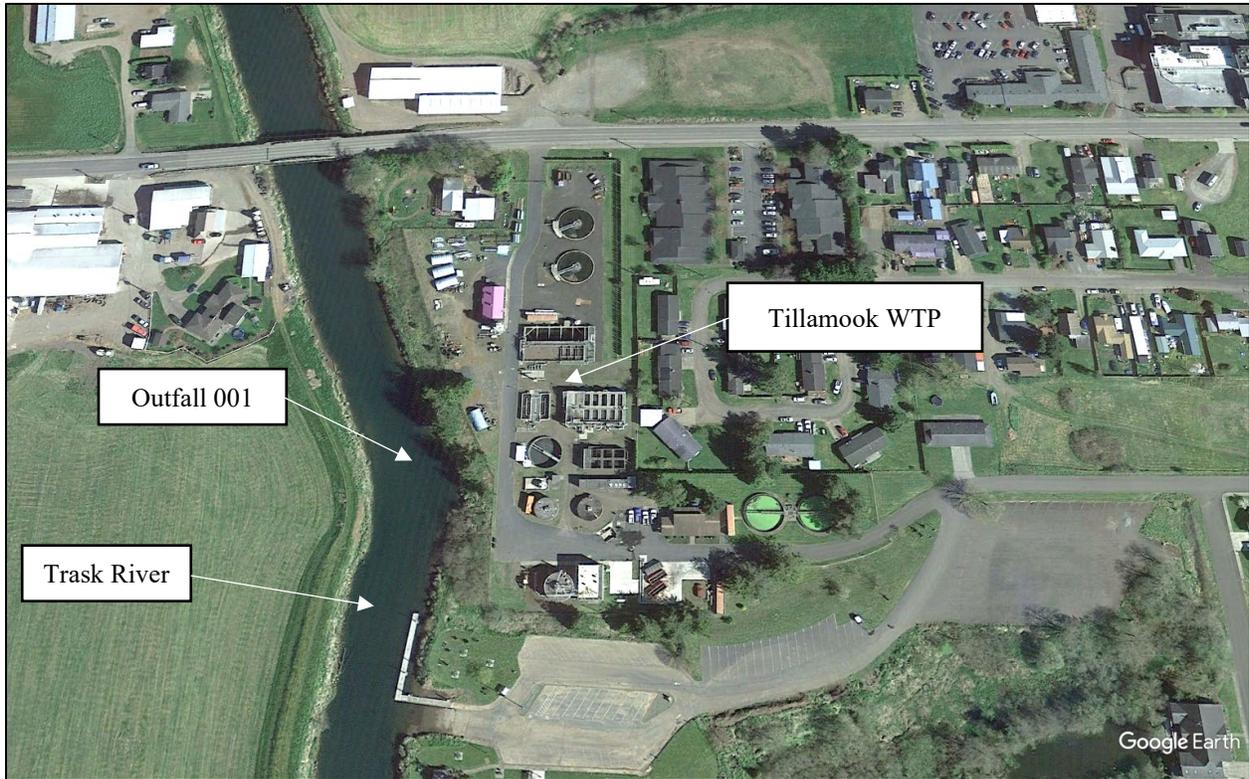


Photo Source: Google Earth, 2023

Figure 2-1: Facility and Outfall Locations

The WTP includes the following major treatment components:

- One step screen with bypass channel equipped with manual screen
- One vortex grit removal unit
- Two primary clarifiers
- One aeration basin
- Two secondary clarifiers
- One rotary drum thickener
- One anaerobic digester
- Two chlorine contact tanks

The permittee's overall process sequence at the WTP consists of the headworks screening and grit removal, a primary influent pumping station, two primary clarifiers, an aeration basin, two secondary clarifiers, a rotary drum thickener, an anaerobic digester, and two chlorine contact tanks. Sodium hypochlorite is used for disinfection and sodium bisulfite is used for dechlorination. A general flow schematic of the WTP is included in Appendix A.

Primary treatment includes screening, grit removal, and primary clarifiers. Variable frequency drives (VFDs) are used to transport raw wastewater to a step screen with 6 mm openings at the headworks. Grit is removed in a single gravity vortex unit. The grit handling process removes inert particulate matter from the screened raw sewage to reduce abrasive wear on downstream equipment and reduce the amount of material that settles in the tanks.

After screenings and grit removal, the wastewater flows to the primary clarifiers. The primary clarifiers concentrate the settleable portion of the suspended solids in the wastewater in the bottom of the clarifier. There are two primary clarifiers, each 20 feet wide by 60 feet in length. Settled solids are collected by rake mechanisms and transferred by progressive cavity pumps to the solids handling system. Effluent from the primary clarifiers is conveyed by gravity to the secondary treatment system.

The secondary treatment system consists of a single aeration basin with four biological zones, each set up for varying levels of mixing or aeration. The primary and conventional process mode is to distribute all primary effluent to Zone 1. Zone 1 consists of three cells, each with mixers to create a “No” free oxygen condition. The aeration basin is equipped with mixed liquor recycle pumps that can return nitrified effluent from the end of Zone 3 to Zone 1 for denitrification. A portion of the primary effluent may be transferred to the end of Zone 2 in a process mode referred to as step feed activated sludge. A portion of the primary effluent may also be transferred to the end of Zone 3 during a process referred to as hybrid contact stabilization activated sludge. The result of the aeration basin process is a settleable floc suitable for separation and removal in the secondary clarifier.

Secondary treatment also consists of two secondary clarifiers with return and waste activated sludge systems. The secondary clarifiers allow floc to settle out of the mixture forming a sludge on the bottom of the clarifier. This sludge can be drawn off and pumped back to the aeration basins as return activated sludge to improve process efficiency.

The secondary effluent is disinfected using chlorination prior to discharge into the Trask River. The chlorination system includes two chlorine contact tanks, each containing two channels used to provide adequate time for disinfection of secondary effluent. Sodium hypochlorite is used for disinfection and sodium bisulfite is used for dechlorination prior to discharge. The disinfected effluent is discharged by gravity to the Trask River through a 30-inch pipe with two discharge ports.

The solids processing system includes an anaerobic digester and rotary drum thickener. The anaerobic digester stabilizes and reduces the volume of volatile solids, usually by 40 percent or more, with a retention time of 38 days. The rotary drum thickener can be used for thickening or dewatering solids to reduce the amount of sludge remaining for disposal. Primary and secondary sludge make up the inflow to solids processing. Since 2012, the final dewatered sludge has been hauled to the Coffin Butte landfill in Oregon for disposal. The current practice of landfill disposal does not require a Biosolids Management Plan and Land Application Plan. However, this permit allows the permittee to land apply processed biosolids in accordance with Schedule A, Section 4 and Schedule B, Section 9 of the permit, and a DEQ-approved Biosolids Management Plan and Land Application Plan. Prior to land application of biosolids, the

permittee must submit and receive approval of a Biosolids Management Plan and Land Application Plan. Any proposed Biosolids Management Plan and Land Application Plan will be made available for public comment.

2.2 Outfalls

The WTP’s point of discharge into the Trask River (Outfall 001) is located approximately 1.7 miles upstream of Tillamook Bay along the east bank of the Trask River (RM 1.7) (Figure 2-1). Constructed in 2009 as part of a major facility upgrade, the outfall consists of a 30-inch diameter pipe oriented perpendicular to the riverbank with two discharge ports. Each port is fitted with a duckbill check valve, pointing downstream in the direction of the river current and at an angle of 30 degrees above horizontal. At mean lower low water (MLLW), the outfall extends approximately 35 feet from the riverbank at a depth of 8.1 feet. The outfall is designed to handle all expected flows from the facility (Table 2-1).

The proposed permit requires the permittee to inspect and report on the integrity and function of Outfall 001 during the third year of the next permit term. The requirements for the outfall inspection are presented in Schedule D of the permit.

The proposed permit provides the Tillamook WTP with the option for discharging recycled water when a recycled water use plan is developed and approved by DEQ. This is identified as Outfall 002.

Table 2-1: List of Outfalls

Outfall Number	Type of Waste	Lat/Long	Design Flow ¹ (mgd)	Existing Flow ² (mgd)
001	Treated Wastewater	45.4549N/-123.8590	1.2	0.9
002	Recycled Water	45.4549N/-123.8590	To be determined	To be determined
1. Design Flow = design average dry weather flow 2. Existing Flow = existing average monthly dry weather flow for May 1 through October 31. Average flows for July through October are 0.6 MGD.				

2.3 Stormwater

The 1200-Z Industrial Stormwater general permit is required for wastewater treatment facilities with a design flow of 1 MGD or more unless all facility stormwater is collected, treated, and discharged as part of its treated wastewater. DEQ’s industrial stormwater program will engage the permittee to determine applicability. Discharges of industrial stormwater are not authorized by this permit.

2.4 Industrial Pretreatment

The permittee conducted an Industrial User Survey during the last permit cycle and determined that a DEQ-approved industrial pretreatment program is not needed. No categorical industrial users were identified in the IU survey update submitted with the city’s permit renewal application.

The proposed permit requires the permittee to conduct and submit to DEQ an updated Industrial User Survey (Survey) within five years of permit issuance. DEQ will review the Survey results and, if DEQ determines that a pretreatment program is required, the permit may be reopened and modified to require development of a pretreatment program.

2.5 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 show the limits contained in the existing permit.

Table 3-1: Existing Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
Biochemical Oxygen Demand, 5-day @ 20°C (BOD ₅) (May 1 – October 31)	mg/L	20	30	--
	lbs/day	177	265	354
	% removal	85 ^g	--	--
Total Suspended Solids (TSS) (May 1 – October 31)	mg/L	20	30	--
	lbs/day	177	265	354
	% removal	85 ^g	--	--

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD ₅ (November 1 – April 30)	mg/L	30	45	--
	lbs/day	530	795	1060
	% removal	85 ^g	--	--
TSS (November 1 – April 30)	mg/L	30	45	--
	lbs/day	530	795	1060
	% removal	85 ^g	--	--
pH ^a	Standard Units	Between 6.0 and 9.0		
Total Residual Chlorine ^b	mg/L	0.01	--	0.02
Fecal coliform bacteria (May 1 – October 31) ^c	# organisms/100 mL	200 ^d	--	400
Fecal coliform bacteria (November 1 – April 30) ^c	# organisms/100 mL	49 ^d	--	151
<i>E. coli</i> bacteria ^f	# organisms/100 mL	126 ^d	--	406
Excess Thermal Load ^h (Year-Round)	Option A (7-day rolling average)	Option B (7-day rolling average)		
	Shall not exceed a 7-day rolling average of 11.8 million Kcals	Shall not exceed a 7-day rolling average as calculated in the equation below		
Notes:				
<p>a. May not be outside the range of 6.0 to 9.0 Standard Units.</p> <p>b. Calculated effluent limitations are below analytic range of available methods. The compliance level is equal to the Quantitation Limit which is 0.05 mg/L monthly average and 0.05 mg/L daily maximum.</p> <p>c. No single fecal coliform sample may exceed 400 organisms per 100 mL from May 1 through October 31. The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 200 fecal coliform organisms/100 mL to demonstrate compliance with the limit.</p> <p>d. Reported as a monthly geometric mean.</p> <p>e. No single fecal coliform sample may exceed 151 organisms per 100 mL from November 1 through April 30. The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 49 fecal coliform organisms/100 mL to demonstrate compliance with the limit.</p> <p>f. No <i>E. coli</i> sample may exceed 406 organisms per 100 mL. The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 <i>E. coli</i> organisms/100 mL to demonstrate compliance with the limit.</p> <p>g. The 85% removal limit does not apply when the monthly average influent BOD or TSS is less than 167 mg/L.</p>				

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
<p>h. The permittee must comply with the excess thermal load limit using option A or B. For option B, the daily Excess Thermal Load Limit (ETLL) must be calculated using the formula below.</p> $ETLL = (Q_e * 1.548 + Q_r / 4) * (0.3) * 2.448 \text{ million kcals/day, as a 7-day rolling average}$ <p>Where:</p> <p>ETLL= Excess Thermal Load Limit (kcal/day), as a 7-day rolling average</p> <p>Q_e = Daily Average Effluent Flow (MGD)</p> <p>Q_r = Daily Average Trask River Flow (cfs)</p>				

In the existing permit, the May 1 – October 31 mass limits are based on a dry weather design flow of 1.06 MGD. Average wet weather design flow is 2.12 MGD and mass load limits from November 1 to April 30 are based on 2.12 MGD.

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 (BOD₅), total suspended solids (TSS) and pH (i.e., federal secondary treatment standards). Substitution of 5-day carbonaceous oxygen demand (CBOD₅) for BOD₅ is allowed. The numeric standards for these pollutants are contained in 40 CFR 133.102. In addition, DEQ has developed minimum design criteria for BOD₅ 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	Low stream flow (approximately May 1 – October 31; 20 mg/L for BOD and TSS)
TSS (mg/L)	30	45	
pH (S.U.)	6.0 – 9.0. (instantaneous)		Not applicable

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 or CBOD ₅ and TSS % Removal	85%	Not applicable	Not applicable

The limits for BOD₅ 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 BOD₅ and TSS monthly average concentrations of 20 mg/L during the dry weather season and 30 mg/L during the wet weather season.

DEQ uses the maximum monthly design flow to calculate the mass load limits. The existing 2018 permit limits were based upon an average dry weather design flow of 1.06 MGD and a wet weather design flow of 2.12 MGD. As documented in the 2018 Permit Evaluation Report (PER), the actual facility design flows were uncertain and needed to be re-evaluated as result of the 2010 facility upgrade. As a condition of the 2018 permit renewal, the permittee completed a capacity evaluation of the facility which confirmed an average dry weather design flow of 1.20 MGD and an average wet weather design flow of 2.80 MGD for the facility.³

The confirmed dry and wet weather design flows are slightly higher than those used to develop the permitted mass loads in the existing 2018 permit. Calculating mass load limits based upon the higher confirmed design flows would result in an increase in the existing permitted mass loads. Based upon a review of Discharge Monitoring Reports (DMRs) submitted by the facility from 2018 through 2022, the facility is currently discharging well below the permitted limits for both TSS and BOD₅. For example, maximum recorded dry weather flows are typically half of the newly confirmed average dry weather design flow of 1.20 MGD. This also suggests that the most probable maximum dry weather discharge anticipated during the next permit term would still be well below the facility’s previous documented design flow of 1.06 MGD.

The facility is operating well below permitted limits, and the permittee is not seeking a mass load increase with this permit renewal based upon the updated design flows. However, the permittee has the option to request a mass load increase during the permit term or at the next permit renewal. For this permit renewal, the dry and wet weather design flows from the 2018 permit were used to maintain the current mass load limits in the permit renewal (Refer to Table 3-3).

³ *Capacity Evaluation for the Tillamook Wastewater Treatment Plant*. Table ES-4 Tillamook WTP Description and Design Criteria. Final Report – May 2023.

To calculate the mass load limits for the dry and wet weather seasons, the following formula was used:

$$\text{Monthly Avg Mass Load} = \text{Design Flow}^* \times \text{Monthly Concentration Limit} \times \text{Unit Conversion factor}$$

$$\text{Weekly Average Mass Load} = 1.5 \times \text{Monthly Average Mass Load Limit}$$

$$\text{Daily Maximum Mass Load} = 2 \times \text{Monthly Average Mass Load Limit}$$

* Design flow is the average dry weather design flow (ADWDF) or average wet weather design flow (AWWDF).

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 BOD ₅ Concentration Limit (mg/L)
Dry Weather	1.06	20	20
Wet Weather	2.12	30	30
Design flow comments: Dry weather: Average Dry Weather Design Flow (ADWDF); Wet weather: Average Wet Weather Design Flow (AWWDF). Both design flows are the same as from the 2018 permit.			

Example: Mass Load Calculations for Dry Weather:

Monthly Average: $1.06 \text{ MGD} \times 20 \text{ mg/L} \times 8.34 = 177 \text{ lbs/day}$ (rounded to 180 lbs/day for two significant figures)

Weekly Average: $180 \text{ lbs/day monthly average} \times 1.5 = 270 \text{ lbs/day}$

Daily Maximum: $180 \text{ lbs/day monthly} \times 2 = 360 \text{ lbs/day}$

The existing 2018 permit did not account for rounding to two significant digits consistent with DEQ’s numeric rounding conventions associated with the accuracy of TSS and BOD₅ measurements of 10 or greater. The rounding to two significant figures resulted in slight increases to the mass load limitations in the permit renewal.

In order to allow these slight increases in the TSS and BOD load limits, DEQ must determine if anti-backsliding requirements prohibit the less stringent limits. In accordance with 40 CFR 122.44(l)(2)(i)(B), backsliding is allowed if it is determined that “technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).” DEQ has determined that the inclusion of the previous load limits was the result of a technical mistake and, therefore, meets the anti-backsliding exception.

In addition, DEQ must ensure antidegradation requirements are also met. Section 3.3.2, below, includes a description of a dissolved oxygen (DO) analysis that concluded that the discharge is not considered a reduction in water quality under Oregon's antidegradation rule. A separate analysis was conducted to determine if the increase in TSS load limits would have the potential to result in a degradation of water quality. This analysis, which is part of the permit renewal file, conservatively estimates that the downstream TSS concentrations will increase by a maximum of 1.7%. Under DEQ's antidegradation policy, an impact of 2.5% or less is considered a de minimis lowering of water quality that does not require a full antidegradation review.

The existing permit (and prior versions of the permit) provided an adjustment to the 85 percent removal requirement for BOD₅ and TSS as allowed by Federal regulations under 40 CFR 133.103. Specifically, this adjustment removed the percent removal requirement when the monthly average influent BOD₅ or TSS concentrations are below 167 mg/L. As detailed in the 2018 PER for the existing permit, Federal regulations (40 CFR 133.103(d)) include special considerations for less concentrated influent wastewater from separate sewers. The rule allows substitution of either a lower percent removal requirement or a mass loading limit for the percent removal requirements provided that the permittee satisfactorily demonstrates that:

- The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits, but it's percent removal requirements cannot be met due to less concentrated influent wastewater;
- To meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limits (defined as at least 5 mg/l more stringent than the otherwise applicable concentration-based limits) than would otherwise be required by the concentration-based standards; and,
- The less concentrated influent wastewater is not the result of excessive infiltration and inflow (I/I).

When these three conditions are met, federal regulations allow relaxed percent removal and mass load requirements during wet weather. The 2018 PER determined that the facility met all three conditions above and included an adjustment to the 85 percent removal requirement for BOD₅ and TSS when average monthly influent flows were below 167 mg/L.

For this permit renewal, DEQ conducted a new assessment to determine if the facility continues to meet each condition. The results of that assessment are summarized below:

1. Based upon a review of discharge monitoring reports submitted from 2018 to 2023, the permittee continues to comply with the first provision as the facility consistently meets the permit's BOD and TSS concentrations limits.
2. To assess the second provision, DEQ needs to show that meeting the 85 percent removal rule would require meeting BOD or TSS concentrations 5 mg/L less than what would otherwise be required. The facility's winter limits are 30 mg/L for BOD and TSS so the analysis needs to show that keeping the 85 percent removal condition would require the City to meet effluent concentrations of 25 mg/L or less. Influent concentrations of 167 mg/L or less would

be required for the facility to meet a 25 mg/L limit. BOD and TSS influent concentrations are frequently below 167 mg/L demonstrating that the second provision is met.

- For the third provision, 40 CFR 35.2005(b)(16) defines excessive inflow and infiltrations as follows:

The quantities of infiltration/inflow which can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the infiltration/inflow conditions to the total costs for transportation and treatment of the infiltration/inflow.

The City’s December 2003 Wastewater Facilities Plan provided cost estimates of \$24 million dollars for a system-wide rehabilitation of the sanitary collection system to remove inflow and infiltration. Using this information, the City determined that it was not economically feasible to eliminate the infiltration/inflow and that it was more cost effective to convey and treat it. DEQ concurred with this plan and approved the City’s 2010 upgrades to the treatment plant which were specifically designed to treat the excessive inflow and infiltration.

DEQ concludes that the City meets each of the three provisions listed above and is granting the City an exception to the 85 percent removal requirement. This exception is being carried forward from the existing permit. The exception will be noted in Table A1 (Permit Limits) in Schedule A of the permit. When the monthly average influent BOD or TSS concentrations are below 167 mg/L, there is no percent removal limit.

To ensure that the city is taking steps to reduce inflow and infiltration, the proposed permit requires the permittee to develop and implement an Inflow Removal Program and submit annual inflow and infiltration reports, as specified in Schedule D, Section 1.

The proposed BOD₅ and TSS limits are listed in the following table.

Table 3-4: Technology Based Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD ₅ (May 1 – October 31)	mg/L	20	30	NA
	lbs/day	180	270	360
	% removal	85	NA	NA
TSS (May 1 – October 31)	mg/L	20	30	NA
	lbs/day	180	270	360
	% removal	85	NA	NA

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD ₅ (November 1 – April 30)	mg/L	30	45	NA
	lbs/day	530	800	1100
	% removal	85	NA	NA
TSS (November 1 – April 30)	mg/L	30	45	NA
	lbs/day	530	800	1100
	% removal	85	NA	NA

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 the Trask River. These uses are listed in OAR-340-041-0230 (Table 230A) for the North Coast Basin.

- Public and private domestic water supply⁵
- Industrial water supply
- Irrigation and livestock watering
- Fish and aquatic life (including salmonid rearing, migration, and spawning)
- Wildlife and hunting
- Fishing
- Boating
- Water contact recreation
- Aesthetic quality

3.3.2 303d 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).

⁵ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

Table 3-5: 303d and TMDL Parameters

Water Quality Limited Parameters (Category 5)	
AU ID:	OR_EB_1710020308_01_107225
AU Name:	Tillamook Bay
AU Status:	Impaired
Year Listed	2002
Year Last Assessed	2022
303d Parameters (Category 5)	E. coli, Fecal Coliform, Dissolved Oxygen-year-round, Dissolved Oxygen-year-round, Dissolved Oxygen-spawn, Temperature-year-round, Temperature-spawn
TMDL Parameters (Category 4)	
Temperature and Fecal Coliform	

DEQ has reviewed information related to the facility’s effluent to determine whether the permittee may be contributing to the Category 5 water quality impairment (Table 3-5).

DEQ performed a conservative Streeter-Phelps analysis to determine if the BOD₅ TBEL limits were lowering the dissolved oxygen by more than 0.1 mg/L. For this analysis DEQ used the maximum reported effluent temperature, the minimum reported DO concentration, the BOD₅ TBEL limit, the 90th percentile of the effluent ammonia concentration, and the maximum reported effluent Total Kjeldahl Nitrogen concentration. For ambient data the 90th percentile of temperature data, maximum BOD₅, maximum ammonia, and maximum TKN concentrations from stations 12959-ORDEQ and 13433-ORDEQ in AWQMS and permittee reported data. A salinity of 0 ppt was assumed as it resulted in a more conservative analysis. Given these conservative conditions, the analysis showed that there was no more than a 0.05 mg/L DO deficit in the river between the outfall and where the Trask River enters the estuary (1.7 miles downstream).

Because NPDES permits have specific limit for *E. coli* that do not allow them to discharge bacteria in excess of the bacteria criterion, it is assumed that the limits contained within the NPDES permit are protective of the bacteria water quality criteria (See section 3.3.8).

3.3.3 TMDL Wasteload Allocations

A Total Maximum Daily Load (TMDL)⁴ for temperature in the North Coast Subbasins, including the Trask River in the vicinity of the facility outfall, was developed by DEQ, and approved by the USEPA in August 2003. The TMDL was modified by addendum in December 2006. The Tillamook Bay Watershed TMDL for fecal coliform, which includes the vicinity of the facility outfall, was approved by USEPA in July 2001. A TMDL can be thought of as an

⁴ Section 303(d) of the Clean Water Act requires each state to develop a list (the “303(d)” list) of water bodies that do not meet state surface water quality standards after implementation of technology-based controls. Each state is then required to complete a Total Maximum Daily Load (TMDL) for water bodies on the 303(d) list. The TMDL must address water quality on a basin-wide scale to ensure overall water quality standards will be met. The North Coast Basin TMDL is available online at: <https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-N-Coast.aspx>.

estimate of the total amount of pollution a waterbody can assimilate without exceeding water quality standards. The TMDL addresses the temperature and fecal coliform listing for this section of the river. A discussion of the temperature issues associated with the discharge and the relationship to the TMDL is presented in Section 3.3.7. A discussion of the fecal coliform issues associated with the discharge and the relationship to the TMDL is presented in Section 3.3.8.

3.3.4 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.

Table 3-6: 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 3-7: Pollutants of Concern

Pollutant	How was pollutant identified?
pH	Effluent Monitoring
Temperature	Effluent Monitoring
Fecal Coliform	Effluent Monitoring
<i>E. coli</i>	Effluent Monitoring
Total Residual Chlorine	Effluent Monitoring
Dissolved Oxygen	Water Quality Limitation
Total Ammonia Nitrogen	Application Requirement
Metals	Application Requirement
Volatile Organic Compounds	Application Requirement
Acid Extractable Compounds	Application Requirement
Base-Neutral Compounds	Application Requirement
Base-Neutral Compounds	Application Requirement

EPA has developed a methodology called Reasonable Potential Analysis (RPA) for determining if there is a reasonable potential for a discharge to cause or contribute to violations of water quality standards for a particular parameter. An RPA takes into account effluent variability, available dilution (if applicable), receiving stream water quality and water quality standards for the protection of aquatic life and human health. If the RPA results indicate that there is a potential for the discharge to cause or contribute to exceedances of water quality standards, the methodology is then used to establish permit limits that will not cause or contribute to violations of water quality standards.

DEQ has adopted EPA’s methodology for conducting an RPA and has developed spreadsheets that incorporate this analysis. 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.

3.3.5 Regulatory Mixing Zone

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

The allowable mixing zone is that portion of the Trask River 50 feet upstream and 100 feet downstream from the point of discharge. The zone of initial dilution (ZID) is that portion of the allowable mixing zone that is within 5 feet upstream and 20 feet downstream of the point of discharge.

The dilutions at the edge of the zone of initial dilution and mixing zone are shown in Table 3-8. These dilutions are based on a 2015 mixing zone study reviewed by DEQ. For this memo, DEQ used CORMIX 12.0.1.0 to simulate the discharge and provide updated dilution values at the edge of the ZID (20 feet downstream) and edge of the regulatory mixing zone (100 feet downstream). These updated model runs resulted in lower dilutions when compared to those from the 2018 permit and are documented in a 2023 Mixing Zone Memo which is part of the administrative record. The exact model inputs used in each design case are included in the mixing zone memo and model files are available in the administrative record.

Table 3-8: Outfall 001 Dilution Summary

Dilution Summary – Year-round						
Water Quality Standard	Tidal Velocity		Effluent Flow (mgd)		Dilution	Location
	Statistic	Flow	Statistic	Flow		
Aquatic Life, Acute	Lowest one-hour average	0.05	Dry Peak Day Design Flow (Harrison 2023)	3.5	4	ZID
Aquatic Life, Chronic	Tidally averaged velocity	0.17	Dry Maximum Month Design Flow (Harrison 2023)	2.3	17	MZ

Human Health, Non-Carcinogen	Tidally averaged velocity	0.17	Dry Maximum Month Design Flow (Harrison 2023)	2.3	12	MZ
Human Health, Carcinogen	Tidally averaged velocity	0.17	Annual Design Flow(Harrison 2023)	2.8	10	MZ

3.3.6 pH

The pH criterion for this basin is 6.5 – 8.5 for both estuarine and fresh waters per OAR 340-041-0235. The federal secondary treatment standards allow the permittee to discharge effluent with a pH between 6.0 and 9.0. This pH range was utilized in a reasonable potential analysis along with effluent data collected from January 2019 to August 2023, and ambient river data collected from January 2013 to March 2023 from three DEQ monitoring stations on the Trask River. Since the facility is located on the Lower Trask River in which flows are tidally influenced, the RPA for pH was conducted under both freshwater and saltwater receiving stream conditions.

DEQ determined there is no reasonable potential for the discharge to exceed the pH criterion at the edge of the mixing zone. This includes both freshwater and saltwater receiving stream conditions. As such, the proposed permit will retain the existing permit limit of 6.0 – 9.0 for pH. These limits are considered to be TBELs. The following tables provides a summary of the data used for the analysis under fresh and estuarine conditions.

Table 3-9: pH Reasonable Potential Analysis (Freshwater)

INPUT	Lower pH Criteria	Upper pH Criteria
1. Dilution at mixing zone boundary	17	17
2. Upstream characteristics		
a. Temperature (deg C)	17.8	6.3
b. pH	7.1	7.6
c. Alkalinity (mg CaCO ₃ /L)	25.0	25.0
3. Effluent characteristics		
a. Temperature (° C)	22.0	15.1
b. pH (S.U.)	6.0	9.0
c. Alkalinity (mg CaCO ₃ /L)	134.1	134.1
4. Applicable pH criteria	6.5	8.5
pH at mixing zone boundary	6.5	7.7
Is there reasonable potential?	No	No
Proposed effluent limits	6.0	9.0
Effluent data source: Facility Discharge Monitoring Reports from January 2019 to August 2023.		
Ambient data source: AWQMS - DEQ Monitoring Station Nos. 13431 (Trask River @Netarts Road (Hwy 6), 12959 (Lower Trask Boat Ramp [Steiner Boat Launch]) and 13433 (Trask River at Highway 101) - Data from January 2013 to March 2023.		

Table 3-10: pH Reasonable Potential Analysis (Estuarine)

INPUT	Lower pH Criteria	Upper pH Criteria
1. Dilution at mixing zone boundary	17	17
2. Upstream characteristics		
a. Temperature (deg C)	17.8	6.3
b. pH	7.1	7.6
c. Alkalinity (mg CaCO3/L)	25.0	25.0
3. Effluent characteristics		
a. Temperature (° C)	22.0	15.1
b. pH (S.U.)	6.0	9.0
c. Alkalinity (mg CaCO3/L)	134.1	134.1
4. Applicable pH criteria	6.5	8.5
pH at mixing zone boundary	6.5	8.0
Is there reasonable potential?	No	No
Proposed effluent limits	6.0	9.0
Effluent data source: Facility Discharge Monitoring Reports from January 2019 to August 2023. Temperature values are maximum monthly values.		
Ambient data source: AWQMS - DEQ Monitoring Station Nos. 13431 (Trask River @Netarts Road (Hwy 6), 12959 (Lower Trask Boat Ramp [Steiner Boat Launch]) and 13433 (Trask River at Highway 101) - Data from January 2013 to March 2023. Salinity is calculated from conductivity and temperature recorded concurrently at these stations. Station 13431 is immediately downstream of facility. Mixing Zone Study recorded maximum salinity of 2.0 PSU on 9/18/2014.		

3.3.7 Temperature

3.3.7.1 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	Rearing/Migration 18°C (OAR 340-041-0028(4)(c))
Applicable dates: Year-round	
Salmon/Steelhead Spawning 13 °C? OAR 340-041-0028(4)(a)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Applicable dates: Not Applicable	
WQ-limited?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
TMDL wasteload allocation assigned?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Applicable dates: Year-round	
TMDL based on natural conditions criterion?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Cold water summer protection criterion applies?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Cold water spawning protection applies?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Comments:	

As noted in Table 3-5, the portion of the Trask River into which the Tillamook WTP discharges is listed as water quality limited for temperature. In 2001, the DEQ issued the Tillamook Bay Watershed TMDL to address the temperature impairment. The TMDL was modified by addendum in 2006⁵. The TMDL Addendum includes a wasteload allocation for the facility which addresses the 18°C rearing and migration criterion for the receiving stream. The wasteload allocation provided by the TMDL has an allowable effluent temperature of 19.8°C when the river flow is 54 cfs and the effluent flow is 2.6 cfs (1.7 MGD). This equates to an Excess Thermal Load Limit (ETLL) of 11.8 million kcals/day (as a 7-day rolling average). The TMDL addendum also includes equations to calculate applicable wasteload allocations for other river and effluent flow rates. The ETLL included in the proposed permit are discussed in more detail in Section 3.3.7.3 below.

3.3.7.2 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°C or more for salmon and steelhead, and 9°C or more for bull trout.

⁵ Addendum #1: Modifications to North Coast Basin Temperature Waste Load and Load Allocations for the Tillamook Bay Watershed Total Maximum Daily Load (TMDL) (June 2001). Prepared by DEQ. November 2006.

Tillamook WTP Discharge: Based on the North Coast Basin fish use and salmonid spawning use maps contained in OAR 340-041 (Figures 230A and 230B, respectively), the designated fish use for this segment of the Trask River is salmon and trout rearing & migration (year-round) and no spawning use. Therefore, the discharge will not cause impairment of an active salmonid spawning area.

- 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°C or more to less than 2 seconds.

Tillamook WTP Discharge: Based on a review of January 2019 to August 2023 effluent data, the maximum effluent temperature at Outfall 001 was 23.0°C in September 2020. Thus, anticipated peak temperatures are expected to be well below 32°C and are not expected to cause an acute impairment or instantaneous lethality due to the thermal plume.

- 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°C or more to less than 5% of the cross-section of 100% of the 7Q10 flow of the water body.

Tillamook WTP Discharge: Based on a review of January 2019 to August 2023 effluent data, the maximum effluent temperature at Outfall 001 was 23.0°C in July 2019. Thus, anticipated peak temperatures are expected to be below 25°C which will prevent or minimize thermal shock due to the thermal plume.

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

Tillamook WTP Discharge: The migration rule is based primarily on the USEPA guidance document, *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* (April 2003)⁶. Section V.3 of the document gives guidance on protecting salmonids from thermal plume impacts and provides this discussion on migration blockage:

Adult migration blockage conditions can occur at 21°C. Therefore, EPA suggests that the cross-sectional area of a river at or above 21°C be limited to less than 25% or, if upstream temperature exceeds 21°C, the thermal plume be limited such that 75% of the cross-sectional area of the river has less than a de minimis (e.g., 0.25°C) temperature increase.

⁶ U.S. Environmental Protection Agency. 2003. *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards*. EPA 910-B-03-002. Region 10 Office of Water, Seattle. WA. Pages 33 -34.

DEQ considers a de minimis temperature increase to be 0.3°C or less (see DEQ’s *Temperature Water Quality Standard Implementation – A DEQ Internal Management Directive*, April 2008). The maximum recorded receiving water temperature upstream of the discharge location is 23°C recorded in July 2019 (data from January 2019 through August 2023). An analysis related to migration blockage indicates that when the receiving water temperature is 21°C and effluent temperature is at the maximum recorded 7-day average value (22.5 °C), the effluent plume, when it reaches 25% of the receiving stream’s cross-sectional area, will be 21.26 °C (See Appendix B). This 0.26°C over the upstream temperature is considered a de minimis increase that prevents or minimizes migration blockage. In addition, the maximum effluent temperature used in the analysis was recorded in July 2019 - before the peak fall migration period for fish in this portion of the Trask River (October through December). Fish migrating past the facility during the fall migration season are exposed to cooler effluent temperatures which further minimizes and reduces fish migration blockage.

In summary, the analysis indicates that the discharge from the Tillamook WTP meets the temperature thermal plume limits in OAR 340-041-0053(2)(d).

3.3.7.3 Temperature Effluent Limits.

The proposed permit includes effluent temperature limitations based upon the North Coast Basin TMDL Addendum No. 1. These limits are expressed as Excess Thermal Load Limits (ETLLs). The TMDL allows for two ETLL options. The first option is a static limit based on fixed critical effluent and ambient river flows. The second option is based on critical effluent flow and the actual (measured) river flow. Both options apply on a year-round basis to be consistent with the TMDL.

The two options included in the proposed permit include the following:

Option A: On a year-round basis, the permittee must meet an ETTL of 11.8 Mkal/day as a seven-day rolling average. This option is based on the fixed effluent flow of 1.7 MGD and the 7Q10 stream flow of 54 cfs – which equates to a fixed ETLL equal to 11.8 million kcals/day. (These flows are considered the critical flows for the facility and receiving stream.) The seven-day rolling average for any specific day is the average of the daily values for that day and the preceding six days.

Option B: On a year-round basis, the permittee has the option to calculate an ETTL when Trask River flow is reported by using the following equation:

$$ETLL = (Q_e * 1.548 + Q_r / 4) * (0.3) * 2.448 \text{ million kcals/day, as a 7-day average}$$

Where:

- ETLL= Excess Thermal Load Limit (million kcal/day)
- Q_e = Daily Average Effluent Flow (MGD)
- Q_r = Daily Average River Flow (cfs)

The USGS maintains a river flow gauge on the Trask River that the permittee can access electronically to obtain stream flow data. Option B is also applied as a seven-day rolling average ETTL for each day that the Option B limit is selected by the permittee.

For both options, the permittee will be required to use the following formula for calculating the facility’s ETL to determine compliance with the ETL limit: To assess compliance with the proposed limit, the

$$ETL = 3.785 * Q_e * \Delta T$$

Where:

Q_e = Daily Average Effluent Flow (MGD)

ΔT = Daily Maximum Effluent Temperature (°C) minus ambient criterion (18°C)

Schedule A of the proposed permit provides the permittee with the options and formulas for calculating the ETL limit. Schedule B provides the permittee with instructions for reporting compliance with the ETL limit under the options.

3.3.8 Bacteria

E. coli

The proposed permit limits for *E. coli* are based on the seasonal allocations in the North Coast Basin TMDL and the standard listed at OAR 340-041-0009(6)(b) requires discharges of bacteria into freshwaters meet a monthly geometric mean of 126 *E. coli* per 100 mL, with no single sample exceeding 406 *E. coli* per 100 mL. If a single sample exceeds 406 *E. coli* per 100 mL, then the permittee may take five consecutive re-samples. If the geometric mean of the five re-samples is less than or equal to 126, a violation is not triggered. The re-sampling must be taken at four-hour intervals beginning within 28 hours after the original sample was taken. The following table includes the proposed permit limits and apply year-round.

Table 3-12: Proposed *E. coli* Limits

E. coli (#/100 ml)	Geometric Mean	Maximum
Existing Limit	126	406
Proposed Limit	126	406

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 shellfish harvesting 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 D). The limits for fecal coliform are seasonal and are included in the table below. The statistics used for limit compliance have changed to align with the applicable rule.

The fecal coliform bacteria limits in the existing permit contained a resampling provision if a single sample exceeded either 400 organisms per 100 mL during summer or 151 organisms per 100 mL during fall/winter/spring. These provisions are only allowed for *E. coli* (OAR 340-041-0009(6)(b)(C)) or for total coliforms for recycled water (OAR 340-041-0009(6)(c)(C)), not for fecal coliform. The TMDL from which the fecal coliform bacteria limits derive does not contain a resampling provision (see Section 3.3.3). Therefore, these provisions will be removed in the new permit.

Table 3-13: 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	67	133
November 1 – April 30	17	52

3.3.9 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.

3.3.9.1 Total Residual Chlorine

The existing permit contains chlorine limits since the permittee uses chlorine to disinfect the effluent before discharging to Trask River. Along with being an effective disinfectant, chlorine is toxic to many aquatic organisms. To ensure that the potential for toxicity is minimized, the permittee employs dechlorination equipment to reduce the presence of chlorine in the discharge.

Since the facility is located on the Lower Trask River in which flows are tidally influenced, the RPA was chlorine was conducted under both freshwater and saltwater receiving stream conditions. The RPAs indicate that the permittee does not have reasonable potential to cause or contribute to an exceedance of water quality criteria within the Trask River for both fresh and saltwater conditions under the current limits. As such, the existing limits are being retained to satisfy anti-degradation requirements.

3.3.9.2 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. Since the facility discharges to a section of the Trask River that is considered tidally influenced, the RPA for ammonia was conducted under both freshwater and saltwater conditions. The analysis used effluent data reported through the facility's discharge monitoring reports from May 2016 through August 2023. Ambient river data was obtained from several DEQ monitoring stations located on the Trask River from January 2013 through March 2023.

The results of the analysis indicated that there is a reasonable potential to exceed water quality standards for ammonia during dry season discharges in late summer and early fall (August – October). The reasonable potential determination is related to freshwater discharge conditions and is due to low river flows in the receiving water during late summer, as well as the occasional higher concentrations of ammonia reported by the facility during the dry season. As such, the proposed permit will include new limits for ammonia that will apply during dry season discharges (May 1 – October 31). The permittee will not be able to meet these limits upon permit issuance and therefore a compliance schedule is necessary (See Section 6).

The analysis did not indicate a reasonable potential to exceed water quality standards for ammonia during the wet season (November 1 to April 30). No ammonia limits are necessary during this time period.

Due to the establishment of the new ammonia limits, the proposed permit increases the frequency of ammonia monitoring when compared to the 2018 permit. In addition, the ammonia monitoring will be conducted year-round.

The following tables provide a summary of the data used for the ammonia analysis and the results of the analysis for both dry (summer) and wet (winter) discharge seasons for freshwater and saltwater analyses.

Table 3-14: Ammonia Analysis Information – (Freshwater Summer)

	Acute	Chronic	
		4-day	30-day
Dilution	4	17	12
Ammonia Criteria	10.9	3.8	1.5
Effluent Data Used			
Ammonia (mg/L)	47.3	47.3	
pH (SU)	7.1	7.1	
Temperature (°C)	22.7	22.7	
Alkalinity (mg/L CaCO3)	30.0	30.0	
Receiving Stream Data Used			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	7.5	7.5	
Temperature (°C)	18.3	18.3	
Alkalinity (mg/L CaCO3)	45.4	45.4	
Ammonia Limit Needed?	Yes		
Calculated Limits	AML	MDL	
Ammonia (mg/L)	11.7	43.4	
Effluent data source			
DMRs from May 2016 to August 2023. Limited ammonia sampling in winter. Temperature and pH are maximum monthly values from January 2019 to August 2023.			
Ambient data source			
AWQMS and Permittee Monitoring. AWQMS data from DEQ Monitoring Station No. 12959 (Trask River @Lower Trask Boat Ramp) from January 2021 to May 2022 and DEQ Monitoring Station No. 13433 (Trask River @ Hwy 101) from January 2013 to March 2023. Permittee ambient monitoring (Permit No. 102579) from Discharge Monitoring Reports from November 2019 to December 2022.			

Table 3-15: Ammonia Analysis Information – (Freshwater Winter)

	Acute	Chronic	
		4-day	30-day
Dilution	4	17	12
Ammonia Criteria	17.7	6.5	2.6
Effluent Data Used			
Ammonia (mg/L)	6.8	6.8	
pH (SU)	6.7	6.7	
Temperature (°C)	18.1	18.1	
Alkalinity (mg/L CaCO3)	20.5	20.5	
Receiving Stream Data Used			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	7.6	7.6	
Temperature (°C)	9.9	9.9	
Alkalinity (mg/L CaCO3)	34.7	34.7	
Ammonia Limit Needed?	No		
Calculated Limits	AML	MDL	
Ammonia (mg/L)	N/A	N/A	
Effluent data source			
DMRs from May 2016 to August 2023. Limited ammonia sampling in winter. Temperature and pH are maximum monthly values from January 2019 to August 2023.			
Ambient data source			
AWQMS and Permittee Monitoring. AWQMS data from DEQ Monitoring Station No. 12959 (Trask River @Lower Trask Boat Ramp) from January 2021 to May 2022 and DEQ Monitoring Station No. 13433 (Trask River @ Hwy 101) from January 2013 to March 2023. Permittee ambient monitoring (Permit No. 102579) from Discharge Monitoring Reports from November 2019 to December 2022.			

Table 3-16: Ammonia Analysis Information – (Saltwater Summer)

	Acute	Chronic	
		4-day	30-day
Dilution	4	17	12
Ammonia Criteria	20.2	2.7	---
Effluent Data Used			
Ammonia (mg/L)	47.3	47.3	
pH (SU)	7.1	7.1	
Temperature (°C)	22.7	22.7	
Alkalinity (mg/L CaCO3)	30.0	30.0	
Receiving Stream Data Used			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	7.5	7.5	
Temperature (°C)	18.3	18.3	
Alkalinity (mg/L CaCO3)	45.4	45.4	
Ammonia Limit Needed?	No		
Calculated Limits	AML	MDL	
Ammonia (mg/L)	N/A	N/A	
Effluent data source			
DMRs from May 2016 to August 2023. Limited ammonia sampling in winter. Temperature and pH are maximum monthly values from January 2019 to August 2023.			
Ambient data source			
AWQMS and Permittee Monitoring. AWQMS data from DEQ Monitoring Station No. 12959 (Trask River @Lower Trask Boat Ramp) from January 2021 to May 2022 and DEQ Monitoring Station No. 13433 (Trask River @ Hwy 101) from January 2013 to March 2023. Permittee ambient monitoring (Permit No. 102579) from Discharge Monitoring Reports from November 2019 to December 2022.			

Table 3-17: Ammonia Analysis Information – (Saltwater Winter)

	Acute	Chronic	
		4-day	30-day
Dilution	4	17	12
Ammonia Criteria	47.5	5.2	---
Effluent Data Used			
Ammonia (mg/L)	6.8	6.8	
pH (SU)	6.7	6.7	
Temperature (°C)	18.1	18.1	
Alkalinity (mg/L CaCO3)	20.5	20.5	
Receiving Stream Data Used			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	7.6	7.6	
Temperature (°C)	9.9	9.9	
Alkalinity (mg/L CaCO3)	34.7	34.7	
Ammonia Limit Needed?	No		
Calculated Limits	AML	MDL	
Ammonia (mg/L)	N/A	N/A	
Effluent data source			
DMRs from May 2016 to August 2023. Limited ammonia sampling in winter. Temperature and pH are maximum monthly values from January 2019 to August 2023.			
Ambient data source			
AWQMS and Permittee Monitoring. AWQMS data from DEQ Monitoring Station No. 12959 (Trask River @Lower Trask Boat Ramp) from January 2021 to May 2022 and DEQ Monitoring Station No. 13433 (Trask River @ Hwy 101) from January 2013 to March 2023. Permittee ambient monitoring (Permit No. 102579) from Discharge Monitoring Reports from November 2019 to December 2022.			

3.3.9.3 Priority Pollutant Toxics

DEQ conducted a reasonable potential analysis for the group of toxics listed in the following table. A complete list of the pollutants is located in the reasonable potential spreadsheets located in Appendix C.

Table 3-18: Toxic Pollutants Analyzed

Toxic Group
Metals
Volatile Organic Compounds
Acid Extractable Compounds
Base-Neutral Compounds
Pesticides
Effluent data source: Tillamook WTP effluent toxics monitoring March 2019 to December 2022.
Receiving water data source: DEQ Monitoring Station Nos. 12959 (Trask River at Lower Trask River Boat Ramp) and 13433 (Lower Trask River at Hwy 101). Data from March 2013 to January 2023.

The RPA used the results of effluent monitoring for toxic substances that was conducted from March 2019 to August 2022. The sampling events included both wet and dry discharge seasons. Ambient river data was obtained from two DEQ monitoring stations located on the Trask River upstream of the facility. The data between the two stations was collected from March 2013 through January 2023. The RPA was conducted for both freshwater and saltwater discharge conditions. The dilutions used in the analysis are presented in Section 3.3.5.

The effluent monitoring for toxic substances included sampling for copper that was conducted from January 2021 to December 2022. Quality control issues were noted in the results of several copper samples which resulted in their removal from analysis. To ensure that adequate copper data is available at the next permit renewal, DEQ extended copper sampling into the next permit term. In addition, DEQ issued an enforcement notice to the permittee requiring a quality control review of their sampling procedures for copper and other toxic substances.

A summary discussion on the results of the RPA relative to toxic metals and organics is presented below:

Metals - The RPA analysis was conducted for priority pollutant metals for both the aquatic life and human health criteria. An RPA for the copper and aluminum freshwater standards is discussed separately in Sections 3.3.9.4 and 3.3.9.5, respectively.

The RPA is a two-step process where the monitoring information is first evaluated for each applicable pollutant parameter to determine if there is the potential for the corresponding criterion to be exceeded at the end-of-pipe. Under freshwater discharge conditions, the RPA identified dissolved zinc (aquatic toxicity criteria) and total recoverable thallium (human health

criteria) as potential pollutants of concern at the end-of-pipe discharge (again, with no consideration for in-stream dilution) (Appendix C: Attachments C-1 and C-2). Under saltwater discharge conditions, the RPA indicated a reasonable potential to exceed aquatic toxicity water quality criteria for dissolved copper at the point of discharge (with no consideration for in-stream dilution) (Appendix C: Attachment C-3).

In the second step of the analysis for each identified pollutant with reasonable potential at the point of discharge under freshwater and saltwater discharge conditions, the ambient river conditions are evaluated using available ambient monitoring data and in-stream dilution values. The completed freshwater and saltwater RPAs indicated that there was “no reasonable potential” for the identified pollutants of concern to cause aquatic toxicity or exceed human health criteria at the edge of mixing zones or zones of initial dilution during freshwater discharge conditions. As such, the permit will not require limits for these parameters. DEQ is requiring further characterization of these pollutants during the next permit cycle.

Priority Pollutant Organics – The Tillamook WTF conducted monitoring for priority pollutant metals and organics in accordance with the frequency and methodology specified in its current NPDES permit. Monitoring for priority pollutant organics was conducted from 2019 - 2022. With regards to the priority pollutant organics, the majority the pollutants were not detected; however, chlorodibromomethane, dichloroboromethane, and bis (2-ethylhexyl)phthalate were detected at low levels in the effluent. In these instances, the freshwater human health analysis did indicate a reasonable potential for these pollutants to exceed water quality criteria at the end of pipe discharge. However, no reasonable potential to exceed water quality human health criteria was indicated when ambient concentrations for detected pollutants and dilution values were entered into the analysis (Appendix C: Attachment C-2). Under saltwater discharge conditions, the detected pollutants did not exceed human health water quality criteria at the end of pipe discharges (Appendix C: Attachment C-4).

Overall, the results of the RPA did not result in any priority pollutant organics exceeding water quality standards at the edge of the regulatory mixing zone for either freshwater or saltwater discharge conditions (Appendix C: Attachments C-2 and C-4, respectively). As such, the permit will not require limits for these parameters. DEQ is requiring further characterization of these pollutants during the new permit cycle. Following the additional characterization, DEQ will conduct a reasonable potential analysis during the next permit renewal.

3.3.9.4 Copper Biotic Ligand Model

Monthly paired effluent and ambient copper Biotic Ligand Model (BLM) input data was collected by Tillamook WTP staff and analyzed by various labs from January 2021 through December 2022. For the RPAs, the mixed concentration of each input parameter was then entered into the BLM model to calculate the instantaneous water quality criteria (IWQC) for each paired data set. Each IWQC was compared to the corresponding copper concentration of the effluent or the calculated value at complete mix. Table 3-19 below shows the sample date, calculated criterion, calculated copper value, and toxic unit (copper concentration divided by the instantaneous criterion). A toxic unit greater than one, indicates there is a potential for the discharge to exceed the criterion. A toxic unit of NA indicates that either the effluent data was below the calculated criteria, the effluent data was non-detect, or the copper data was total

recoverable instead of dissolved. There is not reasonable potential to exceed the dissolved freshwater copper criterion based on this analysis.

Table 3-19: Copper Biotic Ligand Model Results

Date	Effluent Cu ug/L	Ambient Cu ug/L	ZID	BLM CMC	Toxic Units	RMZ	BLM CCC	Toxic Units	100% mix	BLM CCC	Toxic Units
			Cu ug/L	ug/L		Cu ug/L	ug/L		Cu ug/L	Cu ug/L	
1/27/2021	<2	<2	0.00	2.36	NA	0.00	1.36	NA	0.00	1.24	NA
2/5/2021	<2	<2	0.00	3.54	NA	0.00	1.45	NA	0.00	1.45	NA
3/4/2021	<2	<2	0.00	4.18	NA	0.00	1.94	NA	0.00	1.92	NA
4/22/2021	3.53	<2	0.88	5.28	NA	0.21	2.33	0.09	0.11	1.84	0.06
5/20/2021	3.15	<2	0.79	5.28	NA	0.19	2.59	0.07	0.09	2.31	0.04
6/16/2021	4.61	2.73	3.40	3.86	0.88	3.09	2.60	NA	3.04	2.36	NA
7/8/2021	4.25	<2	1.06	7.88	NA	0.25	3.21	0.08	0.13	2.83	0.05
8/5/2021	17.10	<2	4.28	5.87	0.73	1.01	2.08	0.48	0.51	1.79	0.29
9/9/2021	9.53	<2	2.38	13.13	NA	0.56	3.20	0.18	0.29	2.76	0.10
10/7/2021	4.88	<2	1.22	6.48	NA	0.29	2.34	0.12	0.15	2.13	0.07
11/2/2021	3.12	2.35	2.54	4.85	NA	2.40	3.49	NA	2.37	3.84	NA
12/9/2021	2.52	<2	0.63	3.81	NA	0.15	2.34	0.06	0.08	2.70	NA
1/5/2022	<2	<2	0.00	1.00	NA	0.00	1.07	NA	0.00	1.13	NA
2/16/2022	4.34	<2	1.09	3.35	0.32	0.26	1.50	0.17	0.13	1.37	0.09
3/23/2022	<2	<2	0.00	1.60	NA	0.00	1.25	NA	0.00	1.13	NA
4/6/2022	2.68	<2	0.67	1.50	0.45	0.16	0.57	0.28	0.08	0.52	0.15
5/19/2022	3.48	<2	0.87	1.83	0.48	0.20	1.06	0.19	0.10	1.24	0.08
6/7/2022	<2	<2	0.00	1.66	NA	0.00	1.18	NA	0.00	1.26	NA
7/25/2022	2.25	<2	0.56	2.97	NA	0.13	1.53	0.09	0.07	1.39	0.05
8/8/2022	<2	2.23	1.67	3.31	NA	2.10	1.41	NA	2.16	1.39	NA
9/14/2022	2.49	<2	0.62	2.79	NA	0.15	1.33	0.11	0.07	1.40	0.05
10/12/2022	2.42	<2	0.61	3.25	NA	0.14	1.13	0.13	0.07	1.20	0.06
11/16/2022	4.13	<2	1.03	4.01	0.26	0.24	1.60	0.15	0.12	1.38	0.09
12/13/2022	<2	<2	0.00	1.91	NA	0.00	0.91	NA	0.00	1.07	NA

3.3.9.5 Aluminum

Monthly paired effluent and ambient aluminum criteria input data was collected by Tillamook WTP staff and analyzed by various labs from January 2021 through December 2022. For the RPAs, the mixed concentration of each input parameter was then entered into the aluminum criteria model to calculate the instantaneous water quality criteria (IWQC) for each paired data set. Each IWQC was compared to the corresponding aluminum concentration of the effluent or the calculated value at the ZID boundary, the MZ boundary, and at complete mix. All of the effluent data submitted by the permittee was non detect at 50 ug/L. The lowest criteria calculated from the paired data was 180 ug/L. Therefore, the data is considered sufficiently sensitive and there is no reasonable potential to exceed the aluminum criteria.

3.3.9.6 Mercury – Human Health Criterion

Oregon’s human health water quality criterion for mercury is expressed in terms of a fish tissue concentration rather than a water column concentration. Because of this, DEQ’s approach to performing the reasonable potential analysis for mercury is different from that for other parameters. This approach is described in DEQ’s “Implementation of Methylmercury in NPDES Permits” internal management directive.

According to the IMD, “Any facility contributing significant and consistent concentrations of total mercury to the receiving water body is considered to have the reasonable potential to exceed the water quality criterion unless a site-specific survey determines otherwise.” Because the water quality criterion for mercury is a fish tissue-based concentration rather than a water column concentration, permit limits for mercury cannot be expressed in terms of a concentration. Therefore, when mercury is present in treated effluent on a consistent basis, the permit needs to contain mercury monitoring, plus a narrative effluent limit that consists of a Mercury Minimization Plan (MMP).

A review of effluent monitoring data indicates that total mercury is present in the discharge and therefore there is a reasonable potential to cause or contribute to the exceedance of the water quality standard. Accordingly, the proposed permit requires the facility to monitor for mercury (in Schedule B) and develop and implement a mercury minimization plan (in Schedule A). Once the plan is submitted to DEQ for review, it must go on public notice for public review and is incorporated into the permit by reference.

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). As discussed in Section 3.2, above, the proposed permit includes slightly higher TSS and BOD mass load limits. In accordance with 40 CFR 122.44(l)(2)(i)(B), backsliding is allowed if it is determined that “technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).” DEQ has determined that the inclusion of the previous mass load limits was the result of a technical mistake (a rounding error) and therefore meets the antibacksliding exception. The remainder of the limits in the proposed permit are the same or more stringent than those in 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 slightly higher dry and wet weather BOD₅ and TSS mass load limits to address an error in the existing 2018 permit. When the existing permit was developed, the calculation of mass limits did not account for rounding to two significant digits consistent with DEQ’s numeric rounding conventions associated with the accuracy of TSS and BOD₅ measurements of 10 or greater. Rounding the mass load calculations to two significant figures resulted in slight increases to the

mass load limitations in the permit renewal. These increases are within the range of expected conventions of rounding with multiple measurements required for reporting of weekly or monthly mass load limits. They are also within the range of rounding conventions larger values such as daily limits. As noted in Section 3.2, above, an evaluation of these slight increases in mass loads determined that they constitute a de minimis lowering of water quality not requiring a full antidegradation review.

The remaining permit limits have 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

Whole effluent toxicity (WET) tests are used to determine the treated wastewater's aggregate toxic effect on aquatic organisms. Wastewater samples are collected, and aquatic organisms are subjected to a range of concentrations in controlled laboratory experiments. EPA recommends that WET tests be used in NPDES permits together with requirements based on chemical-specific water quality criteria.

WET tests are used to determine the percentage of effluent that produces an adverse effect on a group of test organisms. The measured effect may be fertilization, growth, reproduction, or survival. EPA's methodology includes both an acute test and a chronic test. An acute WET test is considered to show toxicity if adverse effects occur at effluent concentrations less than what is found at the edge of the zone of immediate dilution (ZID). A chronic WET test is considered to show toxicity if adverse effects occur at effluent concentration less than what is known to occur at the edge of the mixing zone.

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 permittee has the capability to develop a new biosolids program to land apply biosolids or produce biosolids for sale and distribution during the term of this permit. Prior to the land application of biosolids, the permittee must develop a comprehensive biosolids management plan and land application plan. DEQ will review the plans and provide an opportunity for public comment on the proposed land application activity. Once approved, conditions in the biosolids management plan and land application plan become permit conditions.

Schedule A of the permit requires the facility to apply biosolids according to their biosolids management plan. In addition, Schedule A requires the following:

- Apply 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.

4.3 Recycled Water or Irrigation of Industrial Wastewater

The permittee does not currently operate a recycled water program but may develop one during the term of this permit. If the permittee chooses to develop a recycled water program, a comprehensive recycled water use plan meeting the requirements in OAR 340-055 will be submitted to DEQ for review and approval; appropriate actions must also be made to OHA and WRD. The recycled water use plan, including the locations of any proposed irrigation projects will be made available for public comment.

Schedule A of the permit requires the permittee to apply recycled water according to their recycled water use plan. Schedule A also restricts the application of recycled water to prevent the following:

- Irrigating above agronomic rates,
- Adverse impact to groundwater,
- Offsite surface runoff or subsurface drainage through drainage tile,
- Creation of odors, fly and mosquito breeding, or other nuisance conditions.

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.

For this permit renewal, DEQ's current monitoring and reporting matrix guidelines for major domestic wastewater treatment facilities resulted in an increase in the frequency of influent and effluent sampling for several parameters such as BOD₅, pH, *E. coli*, and fecal coliform when compared to the existing permit. At the permittee's request, DEQ conducted a review of existing water quality conditions and the permittee's compliance record relative to reducing proposed monitoring frequencies for these parameters. DEQ conducted the review in accordance with USEPA guidance⁷ which determined that the permittee could monitor TSS concentrations and mass once per week while maintaining water quality protection. This is the frequency included in the proposed permit. Due to existing water quality limitations in the Trask River, the review concluded that no reductions in the frequency of monitoring for BOD₅, pH, *E. coli*, or fecal coliform could be allowed from those currently required by DEQ's monitoring and reporting guidelines.

6. Schedule C: Compliance Schedule

The proposed permit contains new water quality-based effluent limits for ammonia for Outfall 001. These limits will apply only to dry season discharges from Outfall 001 from May 1 through October 31. The facility is unable to meet this limit for Outfall 001 upon permit issuance. The proposed permit contains a compliance schedule that allows time for the permittee to make facility modifications in order to meet the new limits. The facility modifications include the development and implementation of an Optimization Study to determine feasible operational changes that can be made to the WTP's existing treatment processes to minimize effluent ammonia concentrations. The compliance schedule lays out a series of milestones for the Optimization Study and implementation of operational changes which, upon completion, will enable the permittee to meet the permit's water quality-based effluent limits (see 40 CFR 122.47 and OAR 340-041-0061(12)). DEQ has reviewed the facility's proposed schedule for the Optimization Study and operational changes and has determined that the proposed compliance schedule is efficient and timely, requiring the permittee to meet the final limits as soon as possible.

⁷ U.S. Environmental Protection Agency. Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies. April 19, 1996 Memorandum.

7. Schedule D: Special Conditions

The proposed permit contains the following special conditions. The conditions include the following:

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 Recycled Water Use Plan

A condition requiring the permittee to develop and maintain a recycled water use plan that meet the requirements in OAR 340-055-0025. The plan must also include location-specific information describing where and how recycled water is managed to protect public health and the environment.

7.4 Exempt Wastewater Reuse at the Treatment System

A condition that exempts the permittee 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.

7.5 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.

7.6 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.

7.7 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.

7.8 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.

7.9 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.

7.10 Whole Effluent Toxicity Testing for Saltwater

Since the permittee discharges into an estuarine section of the Trask River, the permittee is required to perform WET testing under both saltwater and freshwater conditions. Under both receiving water conditions, the permittee is required to perform WET testing to ensure the aggregate of toxics is not negatively impacting aquatic life. This condition describes the test procedures and requirement for the WET testing under saltwater conditions (freshwater WET testing is described in Schedule D Condition 11 of the permit). A dilution series has been specified on the basis of the mixing zone analysis.

7.11 Whole Effluent Toxicity Testing for Freshwater

Since the permittee discharges into an estuarine section of the Trask River, the permittee is required to perform WET testing under both saltwater and freshwater conditions. Under both receiving water conditions, the permittee is required to perform WET testing to ensure the aggregate of toxics is not negatively impacting aquatic life. This condition describes the test procedures and requirement for the WET testing under freshwater conditions (saltwater WET testing is described in Schedule D Condition 10 of the permit). A dilution series has been specified on the basis of the mixing zone analysis.

7.12 Operator Certification

The permittee 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.

7.13 Industrial User Survey Update

This condition requires the permittee to 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.

7.14 Outfall Inspection

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

8. Schedule E: Pretreatment Activities

A pretreatment program is not part of this permit.

9. 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: WTP Flow Schematic

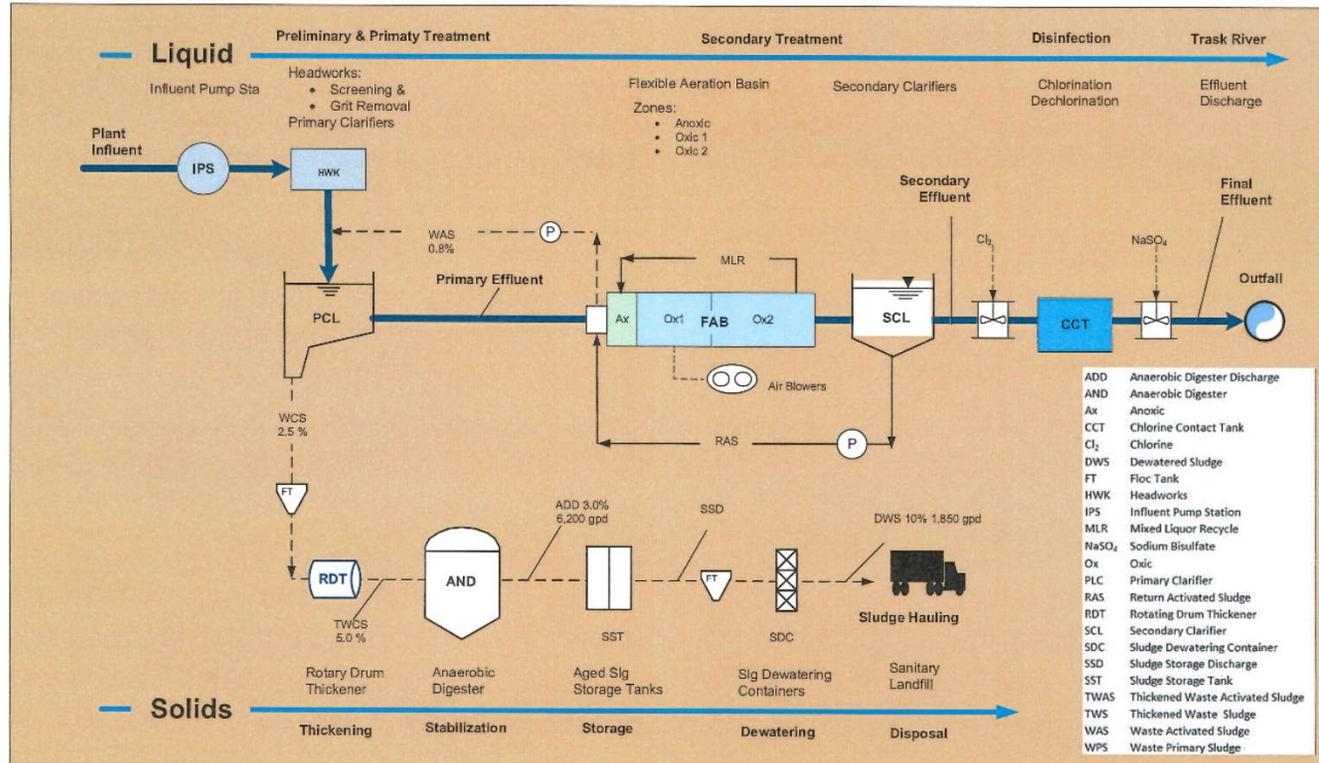


Figure 3.1.3: Flow Schematic – Current (2020) Tillamook WWTP Operation for Population 7500

Appendix B: Temperature Reasonable Potential Analysis

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 salmonids (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: City of Tillamook WTP

Date: November 15, 2023

OAR 340-041-0053(2)(d)(C): Thermal Shock 25 deg C at 5% of the stream cross section	
Enter data into white cells below:	
7Q10 = 54 cfs	Data Metric/Source
Ambient Temperature = 25 °C	Addendum No. 1 - North Coast Basin TMDL
Effluent Flow = 1.8 mgd	Thermal shock criteria
Max Daily Effluent Temperature = 23 °C	ADWDF plus peaking factor (1.2 MGD x 1.5)
	Used max. effluent temp from DMRs January 2019 - August 2023. Higher than 7DAMA-conservative analysis.
5% of 7Q10 = 2.7 cfs	
5% dilution = 2 dilution = $(Qr \cdot 0.05) / Qe + 1$	
Temperature at 5% cross section = 24.0 °C	No Reasonable Potential
Notes:	

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:	
7Q10 = 54 cfs	Data Metric/Source
Ambient Temperature = 21 °C	Addendum No. 1 - North Coast Basin TMDL
Effluent Flow = 1.8 mgd	Migration blockage criteria
Max 7dAM Effluent Temperature = 22.5 °C	ADWDF plus peaking factor (1.2 MGD x 1.5)
	Used max. 7 dAM. from DMRs January 2019 - August 2023.
25% of 7Q10 = 13.5 cfs	
25% dilution = 6 dilution = $(Qr \cdot 0.25) / Qe + 1$	
Temperature at 25% cross section = 21.3 °C	No Reasonable Potential
ΔT at 25% Stream Flow = 0.26 °C	No Reasonable Potential
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:

Q_e = Effluent Flow in mgd

S = Dilution

ΔT_{all} = Allowable temperature increase at edge of MZ ($^{\circ}C$)

C_p = Specific Heat of Water (1 cal/g $^{\circ}C$)

ρ = Density of Water (1 g/cm³)

3785.41 = Flow conversion from mgd to m³/day

Rule Citation - OAR 340-041-0053

(d) Temperature Thermal Plume Limitations. Temperature mixing zones and effluent limits authorized under 340-041-0028(12)(b) will be established to prevent or minimize the following adverse effects to

(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 degrees Celsius (55.4 Fahrenheit) or more for salmon and steelhead, and 9 degrees Celsius (48 degrees Fahrenheit) or more for steelhead.

(B) Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32.0 degrees Celsius (89.6 degrees Fahrenheit) or more to less than 2 seconds;

(C) Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25.0 degrees Celsius (77.0 degrees Fahrenheit) or more to less than 5 percent of the cross section of 100 percent of the 7Q10 low flow of the water body; the Department may develop

(D) Unless the ambient temperature is 21.0 degrees of greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21.0 degrees Celsius (69.8 degrees Fahrenheit) or more to less than 25 percent of the cross section of 100 percent of the 7Q10 low flow of the water body.

Appendix C: Toxics Reasonable Potential Analysis (RPA) Spreadsheets

Attachment C-1: Aquatic Toxicity (Freshwater)

5. Aquatic Toxicity RP

RPA Run Information		Facility Information					
Facility Name:	Tillamook WTP	1. Are there dilution #'s from mixing zone study? (Yes/No) yes					
DEQ File Number:	88665	2. Is the receiving waterbody fresh water? (Yes/No) yes					
EPA Identification #:	OR0020664	3. If Question 1 = "No", then fill in the following table					
Permit Number:	101239	Eff. Flow Rate	MGD	N/A	Calculated dilution Factors		
Prepared By:	Mark Hynson	Stream Flow: 7Q10	CFS	N/A	Dilution @ ZID	N/A	
Preparation Date:	10/18/2023	Stream Flow: 1Q10	CFS	N/A	Dilution @ MZ	N/A	
Facility Flow Rate (MGD):	1.2	% dilution at ZID	%	10%			
Outfall Number:	1	% dilution at MZ	%	25%			
Determination Date:	10/18/23	4. If answered "Yes" to Question #1, then fill in dilution values					
RPA Run Notes:		Dilution @ ZID (1Q10 from study)		4			
		Dilution @ MZ (7Q10 from study)		17			
Color Key: "*" = Enter data "..." = Will calculate		5. Enter Water Hardness. Use average hardness during critical (usually low-flow period). Effluent default is 25 mg/L.					
		Effluent	mg/L CaCO ₃	56.7857143			
		Up-stream	mg/L CaCO ₃	34.6857143			
		ZID boundary	mg/L CaCO ₃	40			
		6. Please enter statistical Confidence and Probability values (note: defaults already entered)					
		MZ boundary	mg/L CaCO ₃	36			
		Confidence Level	%	99%			
		Probability Basis	%	95%			

Pollutant Parameter	Identify Pollutants of Concern						Determine In-Stream Conc.			Det. Reasonable Potential			
	Evaluation Required?	# of Sample	Highest Effluent Conc.	Coefficient of Variation	Est. Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. @ ZID	Max Total Conc. @ RMZ	WQ Crit: 1 Hour (CMC)	WQ Crit: 4 Day (CCC)	Is there Reasonable Potential to Exceed? (Yes/No)	
	(Yes/No)		(µg/l)	Default=0.6	(µg/l)	(Yes/No)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	Acute	Chronic
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD													
Nitrates-Nitrite	Yes	Evaluation will occur with DO analysis											
Table 2 Effluent Parameters for Selected POTWs													
Hardness (Total as CaCO ₃)	Yes	Must be collected for metals criteria calculation. Submit data to the fields at the top of the spreadsheet											
Table 2: Metals (total recoverable), cyanide and total phenols Use total recoverable data as surrogate. no													
Arsenic (total recoverable)	Yes	5	0.111	0.6	--		No Aquatic Water Quality Criteria						
Arsenic (total inorganic)	Yes	--	--	--	--		No Aquatic Water Quality Criteria						

Arsenic (dissolved inorganic)	Yes	--	--	--	--	Data	*	--	--	340.00	150.00	--	--
Cadmium (total recoverable)	Yes	4	0.0322	0.6	0.104508	No	*	--	--	1.40	--	--	--
Cadmium (dissolved)	Yes	4	0.0322	0.6	0.104508	No	*	--	--	0.78	0.13	--	--
Chromium (total recoverable)	Yes	5	0.453	0.6	--	No Aquatic Water Quality Criteria							
Chromium III (dissolved)	Yes	--	--	--	--	Data	*	--	--	854.99	37.31	--	--
Chromium VI (dissolved)	Yes	--	--	--	--	Data	*	--	--	16.00	11.00	--	--
Copper (total recoverable)	Yes	--	--	--	--	No Aquatic Water Quality Criteria							
Copper (dissolved)	Yes	--	--	--	--	Data	0	--	--	See BLM	See BLM	--	--
Iron (total recoverable)	Yes	11	153	0.260066376	210.0096	No	*	--	--	--	1000.00	--	--
Lead (total recoverable)	Yes	5	0.385	0.6	--	No Aquatic Water Quality Criteria							
Lead (dissolved)	Yes	5	0.26	0.6	0.746934	No	*	--	--	25.60	0.87	--	--
Mercury (total)	Yes	12	0.0032	0.471003872	0.005411	No	*	--	--	2.40	0.01	--	--
Nickel (total recoverable)	Yes	5	1.46	0.6	--	No Aquatic Water Quality Criteria							
Nickel (dissolved)	Yes	5	1.34	0.6	3.849584	No	*	--	--	217.07	21.97	--	--
Selenium (total recoverable)	Yes	5	0.102	0.6	--	No Aquatic Water Quality Criteria							
Selenium (dissolved)	Yes	5	0.124	0.6	0.35623	No	*	--	--	13.00	4.60	--	--
Silver (total recoverable)	Yes	5	0.00247	0.6	--	No Aquatic Water Quality Criteria							
Silver (dissolved)	Yes	5	0.00247	0.6	0.007096	No	*	--	--	0.79	0.10	--	--
Zinc (total recoverable)	Yes	14	45	0.408620879	--	No Aquatic Water Quality Criteria							
Zinc (dissolved)	Yes	14	40.2	0.408962998	61.06128	Yes	1.2	16.16532	4.721251804	55.37	50.40	NO	NO
Cyanide (total)	Yes	12	0	0	--	No Aquatic Water Quality Criteria							
Cyanide (free)	Yes	11	0	0	0	No	*	--	--	22.00	5.20	--	--
Total phenolic compounds	Yes					No Aquatic Water Quality Criteria							
Table 2: Volatile organic compounds													
Table 2: Acid-extractable compounds													
Pentachlorophenol	Yes	5	0	0	0	No	*	--	--	pH Data	pH Data	--	--
Table 2: Base-neutral compounds													
Table 3: Pesticides and PCBs													
Aldrin	Yes	5	0	0	0	No	*	--	--	3.00	na	--	--
BHC-gamma (Lindane)	Yes	5	0	0	0	No	*	--	--	0.95	0.08	--	--
Chlordane	Yes	5	0	0	0	No	*	--	--	2.40	0.00	--	--
Chloropyrifos	Yes	--	--	--	--	Data	*	--	--	0.08	0.04	--	--
Demeton	Yes	--	--	--	--	Data	*	--	--	na	0.10	--	--

DDT 4,4'	Yes	5	0	0	0	No	*	--	--	1.10	0.00	--	--
Dieldrin	Yes	5	0	0	0	No	*	--	--	0.24	0.06	--	--
Endosulfan alpha	Yes	5	0	0	0	No	*	--	--	0.22	0.06	--	--
Endosulfan beta	Yes	5	0	0	0	No	*	--	--	0.22	0.06	--	--
Endosulfan	Yes	--	--	--	--	Data	*	--	--	0.22	0.06	--	--
Endrin	Yes	5	0	0	0	No	*	--	--	0.09	0.04	--	--
Guthion	Yes	--	--	--	--	Data	*	--	--	na	0.01	--	--
Heptachlor	Yes	5	0	0	0	No	*	--	--	0.52	0.00	--	--
Heptachlor Epoxide	Yes	5	0	0	0	No	*	--	--	0.52	0.00	--	--
Malathion	Yes	--	--	--	--	Data	*	--	--	na	0.10	--	--
Methoxychlor	Yes	5	0	0	0	No	*	--	--	na	0.03	--	--
Mirex	Yes	--	--	--	--	Data	*	--	--	na	0.00	--	--
Parathion	Yes	--	--	--	--	Data	*	--	--	0.07	0.01	--	--
Toxaphene	Yes	5	0	0	0	No	*	--	--	0.73	0.00	--	--
Total PCBs (Sum of PCB	Yes	--	--	--	--	Data	*	--	--	2.00	0.01	--	--
Table3: Other parameters with state water quality criteria													
Hydrogen Sulfide (dissolved as S)	TBD	--	--	--	--	--	*	--	--	na	2.00	--	--
Phosphorus, Elemental	TBD	--	--	--	--	--	*	--	--	na	na	--	--
tributyltin (TBT)	TBD	--	--	--	--	--	*	--	--	0.46	0.06	--	--

Attachment C-2: Human Health (Freshwater)

7. Human Health RP

RPA Run Information				Facility Information									
Facility Name:	Tillamook WTP			1. Do I have dilution values from a mixing zone study? (Yes/No) Yes									
DEQ File Number:	88665			2. If answered "No" to Question 1, then fill in the following table									
EPA Identification #:	OR0020664			Eff. Flow Rate	MGD	N/A	Calculated dilution Factors						
Permit Number:	101239			Stream Flow: Harmonic M	CFS	N/A	Dilution @ Harmonic Mean						N/A
Prepared By:	Mark Hynson			Stream Flow: 30Q5	CFS	N/A	Dilution @ 30Q5						N/A
Preparation Date:	10/18/2023			% dilution at MZ	%	25%							
Facility Flow Rate (MGD):	1.2			3. If answered "Yes" to Question #1, then fill in dilution values		Dilution @ RMZ: harmonic mean flow						12	
Outfall Number:	1					Dilution @ RMZ: 30Q5 flow						10	
Determination Date:	10/18/23			4. Please enter statistical Confidence and Probability values (note: defaults already entered)		Confidence Level					%	95%	
						Probability Basis					%	95%	
Color Key:	** = Enter data			5. Is the water "fresh" or "salt"?		Fresh							
Intermediate Calc.s	"-." = Will calculate			RPA Run Notes:									
Calculation Results													

Pollutant Parameter	Identify Pollutants of Concern							In-Stream Conc.		Det. Reasonable Potential				
	Evaluation Required?	Carcinogen Status	# of Sample	Effluent Conc.	Coefficient of Variation	Est. Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. @ RMZ	WQ Crit: Water + Fish	WQ Crit: Fish	Is there Reasonable Potential to Exceed? (Yes/No)		
	(Yes/No)	(Yes/No)		(µg/l)	Default=0.6	(µg/l)	(Yes/No)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	Water + Fish	Fish	
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD														
Nitrates-Nitrite	Yes	n	--	--	--	--	Data	*	--	10000	na	--	--	
Table 2 Effluent Parameters for Selected POTWs														
Table 2: Metals (total recoverable), cyanide and total phenols														
										Use total recoverable data as surrogate.				No
Antimony (total recoverable)	Yes	n	3	0.213	0.6	0.638901	No	*	--	5	64	--	--	
Arsenic (total recoverable)	Yes	y	5	0.01208	0.6	No Human Health Water Quality Criteria								
Arsenic (total inorganic)	Yes	Y	--	--	--	--	Data	*	--	2	2.1	--	--	
Copper (total recoverable)	Yes	N	--	--	--	--	Data	*	--	1300	na	--	--	
Mercury (total)	Yes	N	RP is "Yes" if at least 4 mercury samples and 25% or more of samples are above the recommended QL. See methylmercury IMD											
Methyl Mercury	Yes	N	--	--	--	--	Data	*	--	na	0.00014	--	--	
Nickel (total recoverable)	Yes	N	5	1.46	0.6	3.393482	No	*	--	140	170	--	--	
Selenium (total recoverable)	Yes	N	5	0.102	0.6	0.237079	No	*	--	120	420	--	--	
Thallium (total recoverable)	Yes	N	4	0.0173	0.6	0.044725	Yes	0	0.004473	0	0.047	NO	NO	
Zinc (total recoverable)	Yes	N	14	45	0.408620879	61.05905	No	*	--	2100	2600	--	--	
Cyanide (total)	Yes	N	12	0	0	0	No	*	--	130	130	--	--	
Table 2: Volatile organic compounds														
Acrolein	Yes	N	--	--	--	--	Data	*	--	1	0.93	--	--	

Acrylonitrile	Yes	Y	5	0	0	0	No	*	--	0	0.025	--	--
Benzene	Yes	Y	5	0	0	0	No	*	--	0	1.4	--	--
Bromoform	Yes	y	5	0	0	0	No	*	--	3	14	--	--
Carbon Tetrachloride	Yes	Y	5	0	0	0	No	*	--	0	0.16	--	--
Chlorobenzene	Yes	N	5	0	0	0	No	*	--	74	160	--	--
Chlorodibromomethane	Yes	y	16	0.53238	1.015773552	0.9547	Yes	0	0.079558	0	1.3	NO	NO
Chloroform	Yes	n	4	25.6	0.6	66.18294	No	*	--	260	1100	--	--
1,2-Dichlorobenzene (o)	Yes	n	5	0	0	0	No	*	--	110	130	--	--
1,3-Dichlorobenzene (m)	Yes	n	5	0	0	0	No	*	--	80	96	--	--
1,4-Dichlorobenzene (p)	Yes	n	5	0	0	0	No	*	--	16	19	--	--
Dichlorobromomethane	Yes	y	16	0.98747	0.838997782	1.638479	Yes	0	0.13654	0	1.7	NO	NO
1,2-dichloroethane	Yes	y	5	0	0	0	No	*	--	0	3.7	--	--
1,2-trans-dichloroethylene	Yes	n	5	0	0	0	No	*	--	120	1000	--	--
1,1-dichloroethylene	Yes	n	5	0	0	0	No	*	--	230	710	--	--
1,2-dichloropropane	Yes	y	5	0	0	0	No	*	--	0	1.5	--	--
1,3-dichloropropene	Yes	y	--	--	--	--	Data	*	--	0	2.1	--	--
Ethylbenzene	Yes	n	5	0	0	0	No	*	--	160	210	--	--
Methyl Bromide	Yes	n	4	0	0	0	No	*	--	37	150	--	--
Methylene Chloride	Yes	y	5	0	0	0	No	*	--	4	59	--	--
1,1,2,2-tetrachloroethane	Yes	y	5	0	0	0	No	*	--	0	0.40	--	--
Tetrachloroethylene	Yes	y	5	0	0	0	No	*	--	0	0.33	--	--
Toluene	Yes	n	5	2.22	0.6	5.159952	No	*	--	720	1500	--	--
1,1,2-trichloroethane	Yes	y	5	0	0	0	No	*	--	0	1.6	--	--
Trichloroethylene	Yes	y	5	0	0	0	No	*	--	1	3	--	--
Vinyl Chloride	Yes	y	5	0	0	0	No	*	--	0	0.24	--	--
Table 2: Acid-extractable compounds													
2-chlorophenol	Yes	n	5	0	0	0	No	*	--	14	15	--	--
2,4-dichlorophenol	Yes	n	5	0	0	0	No	*	--	23	29	--	--
2,4-dimethylphenol	Yes	n	5	0	0	0	No	*	--	76	85	--	--
4,6-dinitro-o-cresol	Yes	n	5	0	0	0	No	*	--	9	28	--	--
2,4-dinitrophenol	Yes	n	5	0	0	0	No	*	--	62	530	--	--
Pentachlorophenol	Yes	y	5	0	0	0	No	*	--	0	0.30	--	--
Phenol	Yes	n	5	0	0	0	No	*	--	9400	86000	--	--
2,4,5-trichlorophenol	Yes	n	5	0	0	0	No	*	--	330	360	--	--
2,4,6-trichlorophenol	Yes	y	5	0	0	0	No	*	--	0	0.24	--	--
Table 2: Base-neutral compounds													
Acenaphthene	Yes	n	4	0	0	0	No	*	--	95	99	--	--
Anthracene	Yes	n	4	0	0	0	No	*	--	2900	4000	--	--

Benzidine	Yes	y	4	0	0	0	No	*	--	0	0.00002	--	--
Benzo(a)anthracene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Benzo(a)pyrene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Benzo(b)fluoranthene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Benzo(k)fluoranthene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Bis(2-chloroethyl)ether	Yes	y	4	0	0	0	No	*	--	0	0.053	--	--
Bis (2-chloro-1-methylethyl) ether	Yes	n	4	0	0	0	No	*	--	1200	6500	--	--
Chloromethyl Ether, bis	Yes	y	--	--	--	--	Data	*	--	0	0.000029	--	--
Bis (2-ethylhexyl)phthalate	Yes	y	15	0.20558	1.390435027	0.439951	Yes	0	0.036663	0	0.22	NO	NO
Butylbenzyl phthalate	Yes	n	4	0.33	0.6	0.853139	No	*	--	190	190	--	--
2-chloronaphthalene	Yes	n	2	0	0	0	No	*	--	150	160	--	--
Chrysene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Di-n-butyl phthalate	Yes	n	5	0	0	0	No	*	--	400	450	--	--
Dibenzo(a,h)anthracene	Yes	y	5	0	0	0	No	*	--	0	0.0018	--	--
3,3-Dichlorobenzidine	Yes	y	4	0	0	0	No	*	--	0	0.0028	--	--
Diethyl phthalate	Yes	n	4	0	0	0	No	*	--	3800	4400	--	--
Dimethyl phthalate	Yes	n	4	0	0	0	No	*	--	84000	110000	--	--
2,4-dinitrotoluene	Yes	y	4	0	0	0	No	*	--	0	0.34	--	--
1,2-diphenylhydrazine	Yes	y	--	--	--	--	Data	*	--	0	0.02	--	--
Fluoranthene	Yes	n	4	0	0	0	No	*	--	14	14	--	--
Fluorene	Yes	n	4	0	0	0	No	*	--	390	530	--	--
Hexachlorobenzene	Yes	n	4	0	0	0	No	*	--	0	0.000029	--	--
Hexachlorobutadiene	Yes	y	4	0	0	0	No	*	--	0	1.8	--	--
Hexachlorocyclopentadiene	Yes	n	4	0	0	0	No	*	--	30	110	--	--
Hexachloroethane	Yes	y	4	0	0	0	No	*	--	0	0.33	--	--
Indeno(1,2,3-cd)pyrene	Yes	y	4	0	0	0	No	*	--	0	0.0018	--	--
Isophorone	Yes	n	4	0	0	0	No	*	--	27	96	--	--
Nitrobenzene	Yes	n	4	0	0	0	No	*	--	14	69	--	--
N-nitrosodimethylamine	Yes	y	4	0	0	0	No	*	--	0	0.3	--	--
N-nitrosodi-n-propylamine	Yes	y	4	0	0	0	No	*	--	0	0.051	--	--
N-nitrosodiphenylamine	Yes	y	4	0	0	0	No	*	--	1	0.60	--	--
Pentachlorobenzene	Yes	n	4	0	0	0	No	*	--	0	0.15	--	--
Pyrene	Yes	n	4	0	0	0	No	*	--	290	400	--	--
1,2,4-trichlorobenzene	Yes	n	2	0	0	0	No	*	--	6	7	--	--
Tetrachlorobenzene,1,2,4,5	Yes	n	4	0	0	0	No	*	--	0	0.11	--	--
Table 3: Pesticides and PCBs													
Aldrin	Yes	y	5	0	0	0	No	*	--	0	0.0000050	--	--
BHC-Technical	No	y	--	--	--	--	--	*	--	0	0.0015	--	--

BHC-alpha	Yes	y	5	0	0	0	No	*	--	0	0.00049	--	--
BHC-beta	Yes	y	5	0	0	0	No	*	--	0	0.0017	--	--
BHC-gamma (Lindane)	Yes	n	5	0	0	0	No	*	--	0	0.18	--	--
Chlordane	Yes	y	5	0	0	0	No	*	--	0	0.000081	--	--
DDD 4,4'	Yes	y	5	0	0	0	No	*	--	0	0.000031	--	--
DDE 4,4'	Yes	y	5	0	0	0	No	*	--	0	0.000022	--	--
DDT 4,4'	Yes	y	5	0	0	0	No	*	--	0	0.000022	--	--
Dieldrin	Yes	y	5	0	0	0	No	*	--	0	0.0000054	--	--
Endosulfan alpha	Yes	n	5	0	0	0	No	*	--	9	8.9	--	--
Endosulfan beta	Yes	n	5	0	0	0	No	*	--	9	8.9	--	--
Endosulfan Sulfate	Yes	n	5	0	0	0	No	*	--	9	8.9	--	--
Endrin	Yes	n	5	0	0	0	No	*	--	0	0.024	--	--
Endrin Aldehyde	Yes	n	5	0	0	0	No	*	--	0	0.030	--	--
Heptachlor	Yes	y	5	0	0	0	No	*	--	0	0.0000079	--	--
Heptachlor Epoxide	Yes	y	5	0	0	0	No	*	--	0	0.0000039	--	--
Methoxychlor	Yes	n	5	0	0	0	No	*	--	100	na	--	--
Toxaphene	Yes	y	5	0	0	0	No	*	--	0	0.000028	--	--
Total PCBs (Sum of PCB Aroclors)	Yes	y	--	--	--	--	Data	*	--	0	0.0000064	--	--
Table3: Other parameters with state water quality criteria													
Barium (total recoverable)	TBD	n	--	--	--	--	--	*	--	1000	na	--	--
Manganese (total recoverable)	TBD	n	--	--	--	--	--	*	--	Withdrawn	100	--	--
2,4,5-TP [2-(2,4,5-Trichloro-phenoxy) propanoic acid]d	TBD	n	--	--	--	--	--	*	--	10	na	--	--
2,4-D (2,4-Dichlorophenoxy) acetic acid)	TBD	n	--	--	--	--	--	*	--	100	na	--	--
Dioxin 2,3,7,8-TCDD	TBD	y	--	--	--	--	--	*	--	0	5.1E-10	--	--
Nitrosamines	TBD	y	--	--	--	--	--	*	--	0	0.046	--	--
N-Nitrosodibutylamine	TBD	y	--	--	--	--	--	*	--	0	0.022	--	--
N-Nitrosodiethylamine	TBD	y	--	--	--	--	--	*	--	0	0.046	--	--
N-Nitrosopyrrolidine	TBD	y	--	--	--	--	--	*	--	0	3.4	--	--

Attachment C-3: Aquatic Toxicity (Saltwater)

5. Aquatic Toxicity RP

RPA Run Information	
Facility Name:	Tillamook WTP
DEQ File Number:	88665
EPA Identification #:	OR0020664
Permit Number:	101239
Prepared By:	Mark Hynson
Preparation Date:	2/6/2024
Facility Flow Rate (MGD):	1.2
Outfall Number:	1
Determination Date:	2/6/24

RPA Run Notes:

Color Key:	"*" = Enter data
Intermediate Calc.s	"-" = Will calculate
Calculation Results	

Facility Information			
1. Are there dilution #'s from mixing zone study? (Yes/No)			yes
2. Is the receiving waterbody fresh water? (Yes/No)			no
3. If Question 1 = "No", then fill in the following table			
Eff. Flow Rate	MGD	N/A	Calculated dilution Factors
Stream Flow: 7Q10	CFS	N/A	Dilution @ ZID
Stream Flow: 1Q10	CFS	N/A	Dilution @ MZ
% dilution at ZID	%	10%	
% dilution at MZ	%	25%	
4. If answered "Yes" to Question #1, then fill in dilution values			
Dilution @ ZID (1Q10 from study)			4
Dilution @ MZ (7Q10 from study)			17
5. Enter Water Hardness. Use average hardness during critical (usually low-flow period). Effluent default is 25 mg/L.			
Effluent	mg/L CaCO ₃	56.06	
Up-stream	mg/L CaCO ₃	34.6857143	
ZID boundary	mg/L CaCO ₃	40	
MZ boundary	mg/L CaCO ₃	36	
6. Please enter statistical Confidence and Probability values (note: defaults already entered)			
Confidence Level	%	99%	
Probability Basis	%	95%	

Pollutant Parameter	Identify Pollutants of Concern						Determine In-Stream Conc.			Det. Reasonable Potential			
	Evaluation Required?	# of Sample	Highest Effluent Conc.	Coefficient of Variation	Est. Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. @ ZID	Max Total Conc. @ RMZ	WQ Crit: 1 Hour (CMC)	WQ Crit: 4 Day (CCC)	Is there Reasonable Potential to Exceed? (Yes/No)	
	(Yes/No)		(µg/l)	Default=0.6	(µg/l)	(Yes/No)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	Acute	Chronic
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD													
Nitrates-Nitrite	Yes	Evaluation will occur with DO analysis											
Table 2 Effluent Parameters for Selected POTWs													
Hardness (Total as CaCO ₃)	Yes	Must be collected for metals criteria calculation. Submit data to the fields at the top of the spreadsheet											
Table 2: Metals (total recoverable), cyanide and total phenols													
Use total recoverable data as surrogate. <input type="checkbox"/> no													
Arsenic (total recoverable)	Yes	5	0.111	0.6	--		No Aquatic Water Quality Criteria						
Arsenic (total inorganic)	Yes	--	--	--	--		No Aquatic Water Quality Criteria						

5. Aquatic Toxicity RP

Arsenic (dissolved inorganic)	Yes	--	--	--	--	Data	*	--	--	69.00	36.00	--	--
Cadmium (total recoverable)	Yes	4	0.0322	0.6	0.104508	WQ Crit.	*	--	--	--	--	--	--
Cadmium (dissolved)	Yes	4	0.0322	0.6	0.104508	No	*	--	--	40.00	8.80	--	--
Chromium (total recoverable)	Yes	5	0.453	0.6	--	No Aquatic Water Quality Criteria							
Chromium III (dissolved)	Yes	--	--	--	--	Data	*	--	--	--	--	--	--
Chromium VI (dissolved)	Yes	--	--	--	--	Data	*	--	--	1100.00	50.00	--	--
Copper (total recoverable)	Yes	19	17.5	1.276185186	--	No Aquatic Water Quality Criteria							
Copper (dissolved)	Yes	19	7.19	0.95340803	14.31613	Yes	0.15	3.691533	0.983301956	4.80	3.10	NO	NO
Iron (total recoverable)	Yes	11	153	0.260066376	210.0096	WQ Crit.	*	--	--	--	--	--	--
Lead (total recoverable)	Yes	5	0.385	0.6	--	No Aquatic Water Quality Criteria							
Lead (dissolved)	Yes	5	0.26	0.6	0.746934	No	*	--	--	210.00	8.10	--	--
Mercury (total)	Yes	12	0.0032	0.471003872	0.005411	No	*	--	--	2.10	0.03	--	--
Nickel (total recoverable)	Yes	5	1.46	0.6	--	No Aquatic Water Quality Criteria							
Nickel (dissolved)	Yes	5	1.34	0.6	3.849584	No	*	--	--	74.00	8.20	--	--
Selenium (total recoverable)	Yes	5	0.102	0.6	--	No Aquatic Water Quality Criteria							
Selenium (dissolved)	Yes	5	0.124	0.6	0.35623	No	*	--	--	290.00	71.00	--	--
Silver (total recoverable)	Yes	5	0.00247	0.6	--	No Aquatic Water Quality Criteria							
Silver (dissolved)	Yes	5	0.00247	0.6	0.007096	No	*	--	--	1.90	na	--	--
Zinc (total recoverable)	Yes	14	45	0.408620879	--	No Aquatic Water Quality Criteria							
Zinc (dissolved)	Yes	14	40.2	0.408962998	61.06128	No	*	--	--	90.00	81.00	--	--
Cyanide (total)	Yes	12	0	0	--	No Aquatic Water Quality Criteria							
Cyanide (free)	Yes	11	0	0	0	No	*	--	--	1.00	1.00	--	--
Total phenolic compounds	Yes					No Aquatic Water Quality Criteria							
Table 2: Volatile organic compounds													
Table 2: Acid-extractable compounds													
Pentachlorophenol	Yes	5	0	0	0	No	*	--	--	13.00	7.90	--	--
Table 2: Base-neutral compounds													
Table 3: Pesticides and PCBs													
Aldrin	Yes	5	0	0	0	No	*	--	--	1.30	na	--	--
BHC-gamma (Lindane)	Yes	5	0	0	0	No	*	--	--	0.16	na	--	--
Chlordane	Yes	5	0	0	0	No	*	--	--	0.09	0.00	--	--
Chlorpyrifos	Yes	--	--	--	--	Data	*	--	--	0.01	0.01	--	--
Demeton	Yes	--	--	--	--	Data	*	--	--	na	0.10	--	--

5. Aquatic Toxicity RP

DDT 4,4'	Yes	5	0	0	0	No	*	--	--	0.13	0.00	--	--
Dieldrin	Yes	5	0	0	0	No	*	--	--	0.71	0.00	--	--
Endosulfan alpha	Yes	5	0	0	0	No	*	--	--	0.03	0.01	--	--
Endosulfan beta	Yes	5	0	0	0	No	*	--	--	0.03	0.01	--	--
Endosulfan	Yes	--	--	--	--	Data	*	--	--	0.03	0.01	--	--
Endrin	Yes	5	0	0	0	No	*	--	--	0.04	0.00	--	--
Guthion	Yes	--	--	--	--	Data	*	--	--	na	0.01	--	--
Heptachlor	Yes	5	0	0	0	No	*	--	--	0.05	0.00	--	--
Heptachlor Epoxide	Yes	5	0	0	0	No	*	--	--	0.05	0.00	--	--
Malathion	Yes	--	--	--	--	Data	*	--	--	na	0.10	--	--
Methoxychlor	Yes	5	0	0	0	No	*	--	--	na	0.03	--	--
Mirex	Yes	--	--	--	--	Data	*	--	--	na	0.00	--	--
Parathion	Yes	--	--	--	--	Data	*	--	--	na	na	--	--
Toxaphene	Yes	5	0	0	0	No	*	--	--	0.21	0.00	--	--
Total PCBs (Sum of PCB	Yes	4	0	0	0	No	*	--	--	10.00	0.03	--	--
Table3: Other parameters with state water quality criteria													
Hydrogen Sulfide (dissolved as S)	TBD	--	--	--	--	--	*	--	--	na	2.00	--	--
Phosphorus, Elemental	TBD	--	--	--	--	--	*	--	--	na	0.10	--	--
tributyltin (TBT)	TBD	--	--	--	--	--	*	--	--	0.37	0.01	--	--

Attachment C-4: Human Health (Saltwater)

7. Human Health RP													
RPA Run Information					Facility Information								
Facility Name:	Tillamook WTP				1. Do I have dilution values from a mixing zone study? (Yes/No) Yes								
DEQ File Number:	88665				2. If answered "No" to Question 1, then fill in the following table								
EPA Identification #:	OR0020664				Eff. Flow Rate		MGD	N/A	Calculated dilution Factors				
Permit Number:	101239				Stream Flow: Harmonic M	CFS	N/A	Dilution @ Harmonic Mean					N/A
Prepared By:	Mark Hynson				Stream Flow: 30Q5	CFS	N/A	Dilution @ 30Q5					N/A
Preparation Date:	2/6/2024				% dilution at MZ	%	25%						
Facility Flow Rate (MGD):	1.2				3. If answered "Yes" to Question #1, then fill in dilution values								
Outfall Number:	1				Dilution @ RMZ: harmonic mean flow 12								
Determination Date:	2/6/24				Dilution @ RMZ: 30Q5 flow 10								
Color Key: ** = Enter data					4. Please enter statistical Confidence and Probability values (note: defaults already entered)								
Intermediate Calc.s	"-" = Will calculate				Confidence Level % 95%								
Calculation Results					Probability Basis % 95%								
					5. Is the water "fresh" or "salt"? Salt								
RPA Run Notes:													
Identify Pollutants of Concern													
Pollutant Parameter	Evaluation Required?	Carcinogen Status	# of Sample	Effluent Conc.	Coefficient of Variation	Est. Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. @ RMZ	WQ Crit: Water + Fish	WQ Crit: Fish	Is there Reasonable Potential to Exceed? (Yes/No)	
	(Yes/No)	(Yes/No)		(µg/l)	Default=0.6	(µg/l)	(Yes/No)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	Water + Fish	Fish
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD													
Nitrates-Nitrite	Yes	n	--	--	--	--	Data	*	--	--	na	--	--
Table 2 Effluent Parameters for Selected POTWs													
Table 2: Metals (total recoverable), cyanide and total phenols													
Use total recoverable data as surrogate. No													
Antimony (total recoverable)	Yes	n	3	0.213	0.6	0.638901	No	*	--	--	64	--	--
Arsenic (total recoverable)	Yes	y	5	0.01208	0.6	No Human Health Water Quality Criteria							
Arsenic (total inorganic)	Yes	Y	--	--	--	--	Data	*	--	--	1.0	--	--
Copper (total recoverable)	Yes	N	19	17.5	1.276185186	31.27287	No	*	--	--	na	--	--
Mercury (total)	Yes	N	RP is "Yes" if at least 4 mercury samples and 25% or more of samples are above the recommended QL. See methylmercury IMD										
Methyl Mercury	Yes	N	--	--	--	--	Data	*	--	--	0.00014	--	--
Nickel (total recoverable)	Yes	N	5	1.46	0.6	3.393482	No	*	--	--	170	--	--
Selenium (total recoverable)	Yes	N	5	0.102	0.6	0.237079	No	*	--	--	420	--	--
Thallium (total recoverable)	Yes	N	4	0.0173	0.6	0.044725	No	0	0.004473	--	0.047	--	NO
Zinc (total recoverable)	Yes	N	14	45	0.408620879	61.05905	No	*	--	--	2600	--	--
Cyanide (total)	Yes	N	12	0	0	0	No	*	--	--	130	--	--
Table 2: Volatile organic compounds													
Acrolein	Yes	N	--	--	--	--	Data	*	--	--	0.93	--	--

7. Human Health RP

Acrylonitrile	Yes	Y	5	0	0	0	No	*	--	--	0.025	--	--
Benzene	Yes	Y	5	0	0	0	No	*	--	--	1.4	--	--
Bromoform	Yes	y	5	0	0	0	No	*	--	--	14	--	--
Carbon Tetrachloride	Yes	Y	5	0	0	0	No	*	--	--	0.16	--	--
Chlorobenzene	Yes	N	5	0	0	0	No	*	--	--	160	--	--
Chlorodibromomethane	Yes	y	16	0.53238	1.015773552	0.9547	No	*	--	--	1.3	--	--
Chloroform	Yes	n	4	25.6	0.6	66.18294	No	*	--	--	1100	--	--
1,2-Dichlorobenzene (o)	Yes	n	5	0	0	0	No	*	--	--	130	--	--
1,3-Dichlorobenzene (m)	Yes	n	5	0	0	0	No	*	--	--	96	--	--
1,4-Dichlorobenzene (p)	Yes	n	5	0	0	0	No	*	--	--	19	--	--
Dichlorobromomethane	Yes	y	16	0.98747	0.838997782	1.638479	No	*	--	--	1.7	--	--
1,2-dichloroethane	Yes	y	5	0	0	0	No	*	--	--	3.7	--	--
1,2-trans-dichloroethylene	Yes	n	5	0	0	0	No	*	--	--	1000	--	--
1,1-dichloroethylene	Yes	n	5	0	0	0	No	*	--	--	710	--	--
1,2-dichloropropane	Yes	y	5	0	0	0	No	*	--	--	1.5	--	--
1,3-dichloropropene	Yes	y	5	0	0	0	No	*	--	--	2.1	--	--
Ethylbenzene	Yes	n	5	0	0	0	No	*	--	--	210	--	--
Methyl Bromide	Yes	n	4	0	0	0	No	*	--	--	150	--	--
Methylene Chloride	Yes	y	5	0	0	0	No	*	--	--	59	--	--
1,1,2,2-tetrachloroethane	Yes	y	5	0	0	0	No	*	--	--	0.40	--	--
Tetrachloroethylene	Yes	y	5	0	0	0	No	*	--	--	0.33	--	--
Toluene	Yes	n	5	2.22	0.6	5.159952	No	*	--	--	1500	--	--
1,1,2-trichloroethane	Yes	y	5	0	0	0	No	*	--	--	1.6	--	--
Trichloroethylene	Yes	y	5	0	0	0	No	*	--	--	3	--	--
Vinyl Chloride	Yes	y	5	0	0	0	No	*	--	--	0.24	--	--
Table 2: Acid-extractable compounds													
2-chlorophenol	Yes	n	5	0	0	0	No	*	--	--	15	--	--
2,4-dichlorophenol	Yes	n	5	0	0	0	No	*	--	--	29	--	--
2,4-dimethylphenol	Yes	n	5	0	0	0	No	*	--	--	85	--	--
4,6-dinitro-o-cresol	Yes	n	5	0	0	0	No	*	--	--	28	--	--
2,4-dinitrophenol	Yes	n	5	0	0	0	No	*	--	--	530	--	--
Pentachlorophenol	Yes	y	5	0	0	0	No	*	--	--	0.30	--	--
Phenol	Yes	n	5	0	0	0	No	*	--	--	86000	--	--
2,4,5-trichlorophenol	Yes	n	5	0	0	0	No	*	--	--	360	--	--
2,4,6-trichlorophenol	Yes	y	5	0	0	0	No	*	--	--	0.24	--	--
Table 2: Base-neutral compounds													
Acenaphthene	Yes	n	4	0	0	0	No	*	--	--	99	--	--
Anthracene	Yes	n	4	0	0	0	No	*	--	--	4000	--	--

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Benzidine	Yes	y	4	0	0	0	No	*	--	--	0.00002	--	--
Benzo(a)anthracene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Benzo(a)pyrene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Benzo(b)fluoranthene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Benzo(k)fluoranthene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Bis(2-chloroethyl)ether	Yes	y	4	0	0	0	No	*	--	--	0.053	--	--
Bis (2-chloro-1-methylethyl) ether	Yes	n	4	0	0	0	No	*	--	--	6500	--	--
Chloromethyl Ether, bis	Yes	y	--	--	--	--	Data	*	--	--	0.000029	--	--
Bis (2-ethylhexyl)phthalate	Yes	y	15	0.20558	1.390435027	0.439951	Yes	0	0.036663	--	0.22	--	NO
Butylbenzyl phthalate	Yes	n	4	0.33	0.6	0.853139	No	*	--	--	190	--	--
2-chloronaphthalene	Yes	n	2	0	0	0	No	*	--	--	160	--	--
Chrysene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Di-n-butyl phthalate	Yes	n	5	0	0	0	No	*	--	--	450	--	--
Dibenzo(a,h)anthracene	Yes	y	5	0	0	0	No	*	--	--	0.0018	--	--
3,3-Dichlorobenzidine	Yes	y	4	0	0	0	No	*	--	--	0.0028	--	--
Diethyl phthalate	Yes	n	4	0	0	0	No	*	--	--	4400	--	--
Dimethyl phthalate	Yes	n	4	0	0	0	No	*	--	--	110000	--	--
2,4-dinitrotoluene	Yes	y	4	0	0	0	No	*	--	--	0.34	--	--
1,2-diphenylhydrazine	Yes	y	4	0	0	0	No	*	--	--	0.02	--	--
Fluoranthene	Yes	n	4	0	0	0	No	*	--	--	14	--	--
Fluorene	Yes	n	4	0	0	0	No	*	--	--	530	--	--
Hexachlorobenzene	Yes	n	4	0	0	0	No	*	--	--	0.000029	--	--
Hexachlorobutadiene	Yes	y	4	0	0	0	No	*	--	--	1.8	--	--
Hexachlorocyclopentadiene	Yes	n	4	0	0	0	No	*	--	--	110	--	--
Hexachloroethane	Yes	y	4	0	0	0	No	*	--	--	0.33	--	--
Indeno(1,2,3-cd)pyrene	Yes	y	4	0	0	0	No	*	--	--	0.0018	--	--
Isophorone	Yes	n	4	0	0	0	No	*	--	--	96	--	--
Nitrobenzene	Yes	n	4	0	0	0	No	*	--	--	69	--	--
N-nitrosodimethylamine	Yes	y	4	0	0	0	No	*	--	--	0.3	--	--
N-nitrosodi-n-propylamine	Yes	y	4	0	0	0	No	*	--	--	0.051	--	--
N-nitrosodiphenylamine	Yes	y	4	0	0	0	No	*	--	--	0.60	--	--
Pentachlorobenzene	Yes	n	4	0	0	0	No	*	--	--	0.15	--	--
Pyrene	Yes	n	4	0	0	0	No	*	--	--	400	--	--
1,2,4-trichlorobenzene	Yes	n	5	0	0	0	No	*	--	--	7	--	--
Tetrachlorobenzene,1,2,4,5	Yes	n	4	0	0	0	No	*	--	--	0.11	--	--
Table 3: Pesticides and PCBs													
Aldrin	Yes	y	5	0	0	0	No	*	--	--	0.0000050	--	--
BHC-Technical	No	y	--	--	--	--	--	*	--	--	0.0015	--	--

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BHC-alpha	Yes	y	5	0	0	0	No	*	--	--	0.00049	--	--
BHC-beta	Yes	y	5	0	0	0	No	*	--	--	0.0017	--	--
BHC-gamma (Lindane)	Yes	n	5	0	0	0	No	*	--	--	0.18	--	--
Chlordane	Yes	y	5	0	0	0	No	*	--	--	0.000081	--	--
DDD 4,4'	Yes	y	5	0	0	0	No	*	--	--	0.000031	--	--
DDE 4,4'	Yes	y	5	0	0	0	No	*	--	--	0.000022	--	--
DDT 4,4'	Yes	y	5	0	0	0	No	*	--	--	0.000022	--	--
Dieldrin	Yes	y	5	0	0	0	No	*	--	--	0.0000054	--	--
Endosulfan alpha	Yes	n	5	0	0	0	No	*	--	--	8.9	--	--
Endosulfan beta	Yes	n	5	0	0	0	No	*	--	--	8.9	--	--
Endosulfan Sulfate	Yes	n	5	0	0	0	No	*	--	--	8.9	--	--
Endrin	Yes	n	5	0	0	0	No	*	--	--	0.024	--	--
Endrin Aldehyde	Yes	n	5	0	0	0	No	*	--	--	0.030	--	--
Heptachlor	Yes	y	5	0	0	0	No	*	--	--	0.0000079	--	--
Heptachlor Epoxide	Yes	y	5	0	0	0	No	*	--	--	0.0000039	--	--
Methoxychlor	Yes	n	5	0	0	0	No	*	--	--	na	--	--
Toxaphene	Yes	y	5	0	0	0	No	*	--	--	0.000028	--	--
Total PCBs (Sum of PCB Aroclors)	Yes	y	4	0	0	0	No	*	--	--	0.0000064	--	--
Table3: Other parameters with state water quality criteria													
Barium (total recoverable)	TBD	n	--	--	--	--	--	*	--	--	na	--	--
Manganese (total recoverable)	TBD	n	--	--	--	--	--	*	--	--	100	--	--
2,4,5-TP [2-(2,4,5-Trichloro-phenoxy) propanoic acid]d	TBD	n	--	--	--	--	--	*	--	--	na	--	--
2,4-D (2,4-Dichlorophenoxy) acetic acid)	TBD	n	--	--	--	--	--	*	--	--	na	--	--
Dioxin 2,3,7,8-TCDD	TBD	y	--	--	--	--	--	*	--	--	5.1E-10	--	--
Nitrosamines	TBD	y	--	--	--	--	--	*	--	--	0.046	--	--
N-Nitrosodibutylamine	TBD	y	--	--	--	--	--	*	--	--	0.022	--	--
N-Nitrosodiethylamine	TBD	y	--	--	--	--	--	*	--	--	0.046	--	--
N-Nitrosopyrrolidine	TBD	y	--	--	--	--	--	*	--	--	3.4	--	--

Appendix D: Fecal Coliform Bacteria Limit Derivation

Background/General Discussion

The 2001 Tillamook Bay Watershed TMDL included fecal wasteload allocations for the City of Tillamook's wastewater treatment plant ("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 the location of shellfish harvesting uses were at some distance downstream of the mouths of the rivers entering the bay. This allowed for dilution to be considered in the TMDL wasteload allocation development (see Section 3.2.7 of the TMDL). The TMDL also used estimates of instream and overland bacteria decay (or die off) 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. The approach used to address the instream decay of bacteria in the TMDL is not affected by this rule change since it only considered decay in the rivers, where there is no designated shellfish harvesting use.

Permit Limit Development

Since OAR 340-041-0230 Figure 230E designates shellfish harvesting as a use within Tillamook Bay near the mouth of the tributary rivers, the fecal coliform criteria are required to be addressed at these locations. 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.⁸

As noted above, the TMDL wasteload allocation for Tillamook was calculated using the dilution value of 3 to 1 that was expected to occur between the mouth of the Trask River and the shellfish harvesting area that was considered under the TMDL. Since the revised rule designates the bay near the mouth of the Trask to be a shellfish harvesting area, this dilution is no longer considered valid for derivation of Tillamook'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) at the mouth of the Trask, the new permit limits are based on targeting the criteria (14 and 43) at the river mouth.

The fecal coliform decay approach used in the TMDL is still considered valid and was used in limit development. These die-off values may be expressed as ratios of the TMDL wasteload allocations to the targeted values at the mouth of the river. Two die off ratios were derived for the Tillamook discharge – one for the summer period and one for fall/winter/spring. This parallels the approach used in the TMDL. These ratios were calculated by dividing the TMDL wasteload allocations for the City of Tillamook

⁸ The TMDL considered the geometric mean and the 90th percentile statistics as equivalent to the statistics in the rule.

(TMDL Table 18) by the fecal coliform values targeted by the TMDL at the mouth of the Trask River. These values are presented in the table below.

Derivation of Decay Ratios Between Discharge Location and Mouth of Trask River				
Season	Criterion	TMDL Target Fecal Coliform	TMDL Wasteload Allocation	Decay Ratio (allocation/target)
Summer (May – Oct)	Median	42	200	4.8
	90 th Percentile	129	400	3.1
Fall/Winter/Spring (Nov-Apr)	Median	42	49	1.2
	90 th Percentile	129	151	1.2
Notes: The Summer wasteload allocations were capped in the TMDL and therefore result in conservative decay ratios.				

The approach used to determine the new fecal coliform limits uses the decay ratios derived above but uses the fecal coliform criteria of 14 (median) and 43 (no more than 10%) as the targeted values for the mouth of the Trask River. The limits in the permit are expressed as a monthly median and a “not more than 10% of the samples may exceed” value.

These limits are presented in the table below.

Derivation of New Fecal Coliform Limits				
Season	Criterion	TMDL Target Fecal Coliform	Decay Ratio (allocation/target)	New Fecal Coliform Limits
Summer (May – Oct)	Monthly Median	14	4.8	67
	Not more than 10% of the samples may exceed	43	3.1	133
Fall/Winter/Spring (Nov – Apr)	Monthly Median	14	1.2	17
	Not more than 10% of the samples may exceed	43	1.2	52