



State of Oregon
Department of
Environmental
Quality

National Pollutant Discharge Elimination System Permit Fact Sheet Cloverdale Sanitary District

Final: Sept. 13, 2024

Permittee	Cloverdale Sanitary District Cloverdale STP 34540 Highway 101 South Cloverdale, OR 97112
Existing Permit Information	File Number: 17318 Permit Number: 102139 EPA Reference Number: OR0027294 Category: Domestic Class: Minor Expiration Date: 9/30/2024
Permittee Contact	Richard Nystrom Direct Operator in Charge 503-392-3117 PO Box 157 Cloverdale, OR 97112
Receiving Water Information	Receiving stream/NHD name: Nestucca River NHD Reach Code & % along reach: 17100203000035 – 80.8 % USGS 12-digit HUC: 171002030210 OWRD Administrative Basin: North Coast ODEQ LLID & River Mile: 1239555451826 – RM 7.0 Assessment Unit ID: OR_EB_1710020302_01_107216
Proposed Action	Permit Renewal Application Number: 948138 Date Application Received: 3/26/2024
Permit Writer	Matthew Schult 971-806-4857 Date Prepared: 8/6/2024

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NPDES Permit Renewal Fact Sheet

Cloverdale Sanitary District

1. Introduction

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

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

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

- Effluent limit for total residual chlorine (Average Monthly) is reduced.
- Proposed updates to monitoring requirements:
 - New requirement to monitor for effluent dissolved oxygen, total Kjeldahl nitrogen and total ammonia (as nitrogen).
 - Removed requirement to monitor influent flow (addressed in 2020 permit modification).
 - Removed requirement to monitor influent mass loading (lb/day) for BOD5 and TSS.
 - Effluent temperature monitoring is now required year-round.

2. Facility Description

2.1 Wastewater Facility

The Cloverdale Sanitary District's (CSD) sewage treatment plant is located at 34540 Highway 101 South within the unincorporated community of Cloverdale in Tillamook County along the Nestucca River (Figure 2-1). The CSD treatment facility was originally placed into operation in 1978. The facility receives domestic sewage from Cloverdale, with a service population of 240 individuals and no industrial contributions. The Nestucca High School contributes a significant portion of influent to the treatment plant from an estimated commuter population of 315 teachers and students who do not reside in Cloverdale. Minor plant and process upgrades occurred in 2003 when dechlorination (via bisulfite) was added, and recently the facility upgraded their tertiary filter system to improve performance and efficiency. The dry weather design flow for this facility is 0.04 MGD. Flows in recent years have averaged around 0.02 MGD, with average peak daily flows of 0.06 MGD.

The facility's sewage collection system consists of 9,400 feet of 8-inch concrete pipe. Domestic wastewater from the community is collected via gravity flow to the facility's headworks where an influent lift station pumps the sewage up to the headworks of the plant for treatment. The facility features a 0.5 million gallon emergency surge basin to contain peak flows that allows the plant to control treatment during these events. The treatment facility utilizes an activated sludge process to treat wastewater to meet pollutant discharge standards for discharge to the Nestucca River in Cloverdale. Treatment occurs in an activated sludge doughnut plant followed by chlorine disinfection, filtration, then dechlorination. Treated effluent discharges via gravity to the Nestucca River near river mile 7.0 (upstream of the boat ramp). See Figure 2-2 for a treatment process diagram.

The treatment plant discharge point (Outfall 001) was constructed as a multi-port diffuser. The 2011 mixing zone survey described the diffuser as "not likely to operate as such". The outfall pipe consists of a 40-foot section of 6-inch steel pipe, installed in the bottom of the river, perpendicular to flow direction, with 3/8-inch by 5-inch slots at 8-inch intervals in the top of the pipe. In this configuration it is subject to being covered/and or filled in with sediment and organic debris. The mixing zone study suggested that most effluent was likely to be discharged from the first two to four slots in the pipe, and that a dye test confirmed the outfall was functioning more as a "point source rather than a line source". Schedule D of the current permit requires the permittee to inspect the outfall annually to ensure that the diffuser pipe remains exposed and functional. The outfall is located northwest of the facility, and has the following coordinates: 45.205958°, -123.893108°.

CSD currently sends all its wastewater solids to the Port of Tillamook Bay for treatment, and therefore does not have biosolids provisions within the current permit. The Port of Tillamook Bay operates a DEQ permitted sludge treatment facility where the wastewater solids may be screened, lime stabilized, and land applied as Class B lime stabilized biosolids or be dewatered for offsite landfilling. In 2023, CSD reported 30,574 gallons of wastewater solids were transferred to the Port of Tillamook Bay for treatment. Although the Cloverdale STP does have the ability to aerobically digest its wastewater solids, CSD does not currently land apply biosolids or produce biosolids for sale or distribution. Biosolids provisions were included in the proposed permit, should the CSD decide to treat biosolids onsite and develop a Biosolids Management Plan. Furthermore, CSD does not land apply or irrigate any recycled water and is not authorized to accept hauled waste.

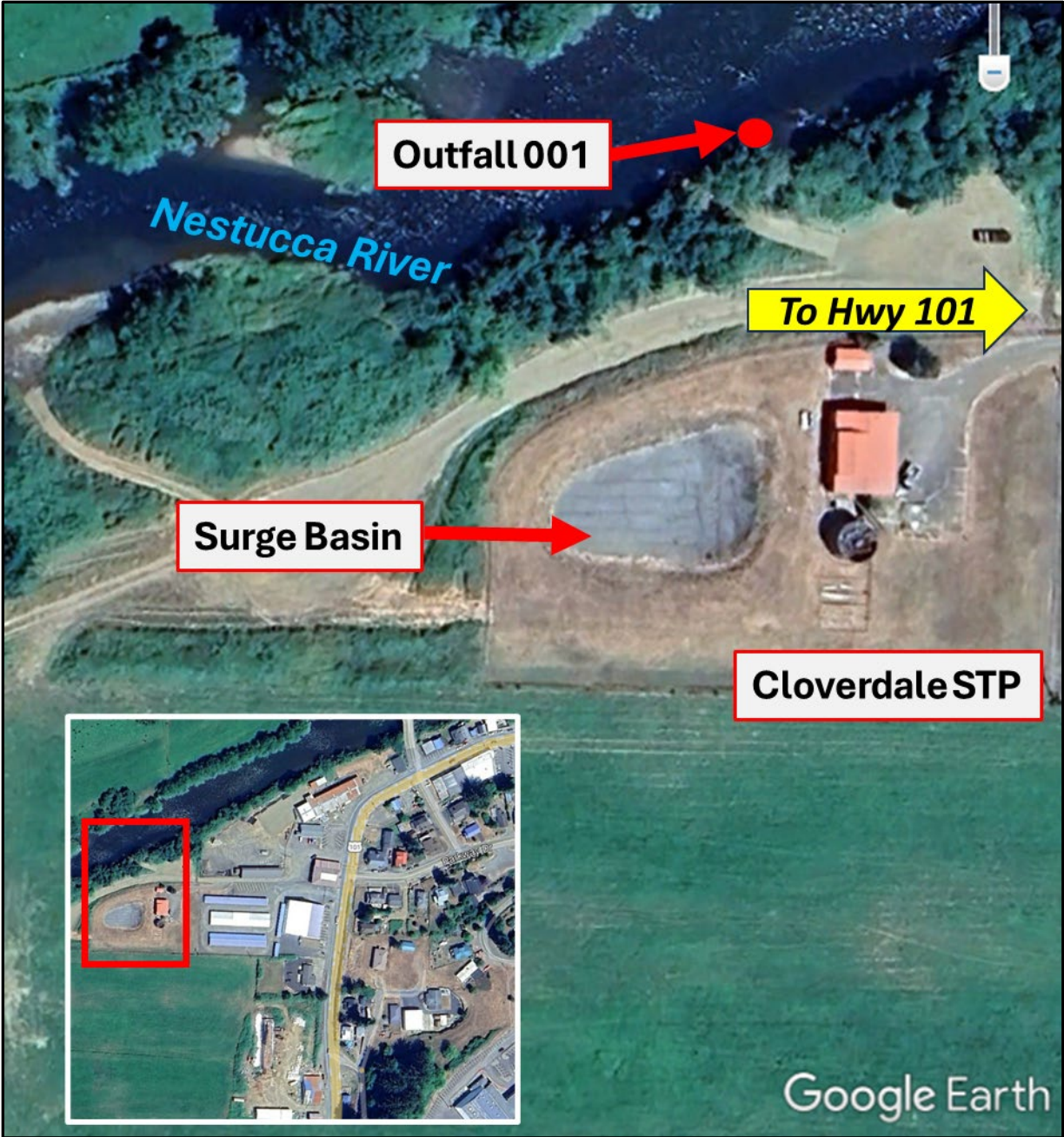


Figure 2-1: Site map for Cloverdale Sanitary District facility.

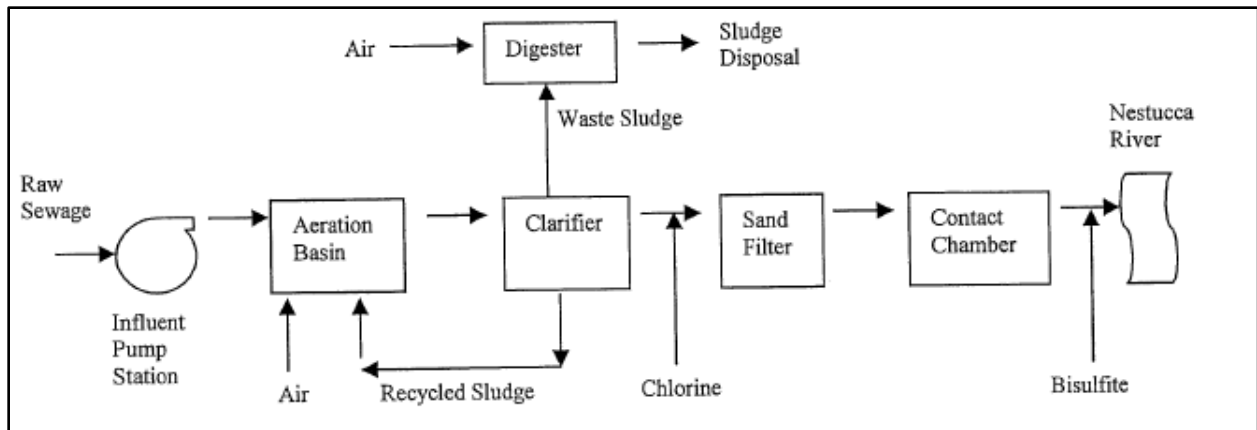


Figure 2-2: Line drawing of Cloverdale wastewater treatment operations.

Table 2-1: List of Outfalls

Outfall Number	Type of Waste	Lat/Long
001	Treated wastewater	45.205958°, -123.893108°

2.2 Stormwater

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

2.3 Industrial Pretreatment

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

2.4 Wastewater Classification

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

3. Schedule A: Effluent Limit Development

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

3.1 Existing Effluent Limits

The tables below show the limits contained in the existing permit.

1. Outfall 001 – Permit Limits

a. BOD₅ and TSS

- i. Year-round. During this time-period the permittee must comply with the limits in the following table:

Table 3-1: BOD₅ and TSS Limits

Parameter	Average Effluent Concentrations, mg/L		Monthly * Average lbs/day	Weekly * Average lbs/day	Daily * Maximum lbs/day
	Monthly	Weekly			
BOD ₅	10	15	3.3	5.0	6.6
TSS	10	15	3.3	5.0	6.6

* Average dry weather design flow to the facility equals 0.04 MGD. DEQ based mass load limits on the average dry weather design flow to the facility.

b. Additional Parameters

The permittee must comply with the limits in the following table (year-round except as noted):

Table 3-2: Limits for Additional Parameters

Year-round	Limits
<i>E. coli</i> bacteria	Must not exceed 57 organisms per 100 mL monthly geometric mean. Any single sample must not exceed 182 organisms per 100 mL. (See note a.)
pH	Must be within the range of 6.0 – 9.0 S.U.
BOD ₅ and TSS Removal Efficiency	Must not be less than 85% monthly average for BOD ₅ , and 85% monthly average for TSS.
Total Residual Chlorine	Must not exceed an average monthly limit of 0.1 mg/L, and a daily maximum of 0.25 mg/L.
Effluent Temperature	Must not exceed 25 °C Maximum 7 day rolling average.

Note:

- a. If a single sample exceeds 182 organisms per 100 mL, then five consecutive re-samples may be taken at four-hour intervals beginning within 28 hours after the original sample was taken. If the log mean of the five re-samples is less than or equal to 57 organisms per 100 mL, a violation is not triggered.

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 3-3: 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	20 mg/L during defined summer months (approx. May 1 – Oct. 31), A minimum of secondary treatment or equivalent control during winter months (approx. November 1 – April 30).
TSS (mg/L)	30	45	
pH (S.U.)	6.0 – 9.0. (instantaneous)		Not applicable
BOD 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). The basin-specific design criteria included in the table above apply to new or expanded facilities (after June 30, 1992). This facility is not new or expanded, so these criteria do not apply. For any facility that has not expanded their average dry weather treatment capacity after June 30, 1992, OAR 340-041-0061(9)(a) requires that the mass load limits be calculated using the following equations:

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

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

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

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

OAR 340-041-0061(9)(a)(C) allows an exception to the daily maximum mass load when the daily flow exceeds the lesser hydraulic capacity of the secondary treatment portion of the facility or twice the design average dry weather flow, the daily mass load limit does not apply.

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

Table 3-4: Design Flows and Concentrations Limits

Season	Design Flow (mgd)	Monthly TSS Concentration Limit (mg/L)	Monthly BOD ₅ Concentration Limit (mg/L)
Year round	0.04	10	10
Design flow comments: Design flow is average dry weather design flow.			

Example: Mass Load Calculations:

$$\text{Monthly Average: } 0.04 \text{ mgd} \times 10 \text{ mg/L} \times 8.34 = 3.3 \text{ lb/day}$$

$$\text{Weekly Average: } 3.3 \text{ lbs/day monthly average} \times 1.5 = 5.0 \text{ lb/day}$$

$$\text{Daily Maximum: } 3.3 \text{ lbs/day monthly average} \times 2 = 6.6 \text{ lb/day}$$

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

Table 3-5: BOD₅ and TSS Technology Based Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD ₅ (Year-round)	mg/L	10	15	NA
	lbs/day	3.3	5.0	6.6
	% removal	85	NA	NA
TSS (Year-round)	mg/L	10	15	NA
	lbs/day	3.3	5.0	6.6
	% 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 Nestucca River Arm. These uses are listed in OAR-340-041-0230, Table 230A for estuaries and adjacent waters in the North Coast basin.

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

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

The following table lists the parameters that are on the 2022 303(d) list (Category 5) within the discharge's stream reach. If a parameter is listed under Category 5, the data in the assessment unit (or nearby assessment unit) indicates a designated use is not supported or a water quality standard is not attained and a TMDL is needed. The table also lists any parameters with an approved TMDL for the discharge's stream reach (Category 4A). If a parameter is listed under Category 4A, TMDLs that will result in attainment of water quality standards and beneficial use support have been approved. See Section 3.3.10 below for discussion on dissolved oxygen in the Nestucca River.

Table 3-6: Category 5 and Category 4A Parameters

Water Quality Limited Parameters (Category 5)	
AU ID:	OR_EB_1710020302_01_107216
AU Name:	Nestucca River
AU Status:	Impaired
Year Listed	2002
Year Last Assessed	2022
Category 5 Parameters	Dissolved oxygen – spawn
Category 4A Parameters	
E. coli, Fecal Coliform, Temperature – year-round, Temperature – spawn	

3.3.3 TMDL Wasteload Allocations

DEQ issued TMDLs for temperature and bacteria for the North Coast basin in 2003. WLAs from this TMDL that are applicable to the permittees are listed in the following table. Refer to section 3.3.7 for discussion of the temperature WLA, and section 3.3.8 for discussion of the bacteria WLA.

Table 3-7: Applicable WLAs

Parameter	WLA	Time Period
Temperature	Not to exceed 25 °C as a 7-day rolling average.	Year-round
Bacteria	Geometric mean of 57 per 100 mL, no single sample to exceed the 90 th percentile of 182 per 100 mL.	Summer (June – September)
	Geometric mean of 126 per 100 mL, no single sample to exceed the 90 th percentile of 406 per 100 mL.	Fall-Winter-Spring (October – May)
Note: The TMDL also allows the limit to be expressed in terms of an excess thermal load. See discussion in Section 3.3.8, below.		

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.

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

Table 3-8: 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 3-9: Pollutants of Concern

Pollutant	How was pollutant identified?
pH	Effluent Monitoring
Temperature	Effluent Monitoring
<i>E. coli</i>	Effluent Monitoring
Total Residual Chlorine	Effluent Monitoring

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 regulatory mixing zone from the existing permit is described as:

The allowable mixing zone is that portion of the Nestucca River contained within a band extending out fifty (50) feet from the south bank of the river and extending from a point fifty (50) feet upstream of the outfall to a point fifty (50) feet downstream of the outfall. The Zone of Immediate Dilution (ZID) shall be defined as that portion of the allowable mixing zone that is within five (5) feet of the point of discharge.

The proposed permit contains minor updates to the mixing zone description for clarity.

The Regulatory Mixing Zone (RMZ) is that portion of the Nestucca River contained within a band extending out fifty (50) feet from the south bank of the river and extending from a point fifty (50) feet upstream of the midpoint of the diffuser to a point fifty (50) feet downstream of the midpoint of the diffuser. The Zone of Immediate Dilution (ZID) is that portion of the allowable mixing zone that is within five (5) feet of the point of discharge.

The outfall extends about twenty feet from the left bank under low flow conditions. It consists of a 6-inch diameter steel pipe perforated by 3/8 x 5-inch slots on 8-inch spacing. The mixing zone study reported that effluent is likely discharged through the first few slots because of the low flow rates and so the discharge was simulated as a single port. The end of diffuser coordinates are 45.205958°, -123.893108°.

The dilution factors at the edge of the Regulatory Mixing Zone and Zone of Initial Dilution are shown in Table 3-10. These dilutions are based on a 2011 mixing zone study reviewed by DEQ. The mixing zone memo documenting this review is in a March 14, 2024 Mixing Zone Memo, as well as in a March 4, 2019 Mixing Zone Memo which is part of the administrative record.

Table 3-10: Mixing Zone Dilution Summary

Dilution Summary – Outfall 001 – Year-Round						
Water Quality Standard	Velocity		Effluent Flow (mgd)		Dilution Factor	Location
	Statistic	Flow	Statistic	Flow		
Aquatic Life, Acute	10 th percentile	0.10 m/s	<input type="checkbox"/> ADWDF x PF <input type="checkbox"/> Max Daily Avg <input checked="" type="checkbox"/> Other: ADWDF	0.04	13	ZID (5ft)
Aquatic Life, Chronic	50 th percentile	0.25 m/s	<input checked="" type="checkbox"/> ADWDF <input type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other:	0.04	156	RMZ (50 ft)
Human Health, Non-Carcinogen	50 th percentile	0.25 m/s	<input checked="" type="checkbox"/> ADWDF <input type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other:	0.04	156	RMZ (50 ft)

ADWDF = Average dry weather design flow
PF = Peaking factor (1.5)

3.3.6 pH

The pH criterion for this basin is 6.5 – 8.5 per OAR 340-041-0235(1)(b). The federal secondary treatment standards allow the permittee to discharge effluent with a pH between 6.0 and 9.0 provided the basin standard is met at the edge of the mixing zone. The pH range of 6.0 to 9.0 was utilized in a reasonable potential analysis for Outfall 001, along with effluent data collected from May 2020 through October 2023, and ambient river data collected from DEQ monitoring station 10523 in the Nestucca River, located upstream of the outfall. DEQ determined there is no reasonable potential for the discharge to exceed the pH criterion at the edge of the mixing zone. The proposed pH limits are 6.0 and 9.0, these limits are considered TBELs. The following table provides a summary of the data used for the analysis.

Table 3-11: pH Reasonable Potential Analysis

INPUT	Lower pH Criteria	Upper pH Criteria
1. Dilution at mixing zone boundary	156.0	156.0
2. Upstream characteristics		
a. Temperature (°C)	17.4	6.9
b. pH	7.2	7.6
c. Alkalinity (mg CaCO ₃ /L)	21.0	21.0
3. Effluent characteristics		
a. Temperature (°C)	21.5	15.5
b. pH (S.U.)	6.0	9.0
c. Alkalinity (mg CaCO ₃ /L)	134.6	134.6
4. Applicable pH criteria	6.5	8.5
pH at mixing zone boundary	7.0	7.6
Is there reasonable potential?	No	No
Proposed effluent limits	6.0	9.0
<u>Effluent data source:</u> NetDMR records from May-2020 to Oct-2023. Alkalinity default value used.		
<u>Ambient data source:</u> DEQ station 10523 (Nestucca R. at Cloverdale), January-2014 to November-2023.		

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 3-12: Temperature Criteria Information

Applicable Temperature Criterion	Core Cold Water 16°C (OAR 340-041-0028(4)(b))
Applicable dates: June 16 – September 14	
Salmon/Steelhead Spawning 13 °C? OAR 340-041-0028(4)(a)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Applicable dates: September 15 – June 15	
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: The temperature WLA for CSD is expressed as a temperature limit of 25 °C, calculated as a 7-day rolling average.	

Water temperatures affect the life cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations. The purpose of the temperature criteria in OAR 340-041-0028 is to protect designated, temperature-sensitive beneficial uses (including salmonid life cycle stages) from adverse warming due to human activities. The section of the Nestucca River that receives discharge from CSD has been designated as Core Cold-Water habitat for salmonids (OAR-340-041, Figure 230A), for the period June 16 through September 14. In addition, this section of the Nestucca River is designated for salmonid spawning for the time period September 15 through June 15 (OAR-340-041, Figure 230B). DEQ developed the temperature TMDL for the Nestucca Bay Watershed in 2002; in November 2006 DEQ revised the TMDL, including the temperature wasteload allocation for CSD. This TMDL includes a WLA, applicable year-round, for the CSD as a maximum allowable effluent temperature of 25 °C (77 °F). (The TMDL also cites Oregon’s thermal plumes limitations, which are addressed below.) This temperature allocation covers both the Core Cold Water and the existing spawning designation periods and is applicable year-round. The TMDL WLA also allows for a limit to be expressed as an excess thermal load. For simplicity, the WLA is addressed in this permit as a temperature limit.

The North Coast Basin TMDL addendum states that WLAs may be recalculated using an updated heat load allocation if stream flow rates or effluent temperatures differ. Subsequent permit renewals or modifications may instead use an excess thermal load limit that considers ambient temperature and flow in its calculation.

Final effluent limits are listed in the following table.

Table 3-13: Temperature Criterion Effluent Limits

Effluent limit needed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
TMDL WLA Limit: 25 °C allowable effluent temperature
Applicable time period: Year-round
Temperature Criterion Limit: NA
Applicable time period: Dates <input checked="" type="checkbox"/> NA
Comments:

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.

Cloverdale STP Discharge: While this segment of the Nestucca River is identified as having salmonid spawning use, the facility's outfall discharges to a reach of the Nestucca River that is tidally influenced. The Oregon Department of Fish and Wildlife (ODFW) does not perform biological assessments of tidally influenced waters for the presence of spawning redds. According to ODFW, this condition makes it highly unlikely that any salmonids would spawn in that location. Additionally, the regional biologist has personally examined the Nestucca River in the vicinity of the facility's outfall and has not observed any redds. Therefore, there is no spawning impairment issue to consider for Cloverdale's discharge. Since the likely location of any active salmonid spawning areas would be outside of the mixing zone, the impairment of an active spawning area is prevented or minimized. DEQ did not include a temperature limit or condition as a result of this RPA.

- 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.

Cloverdale STP Discharge: The maximum measured effluent temperature reported since the permit was last renewed in 2019 was 22.9 °C, well below the temperature expected to cause acute impairment or instantaneous lethality. DEQ did not include a temperature limit or condition as a result of this RPA.

- 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.

Cloverdale STP discharge: The maximum measured effluent temperature from the Cloverdale facility since the permit was renewed in 2019 was 22.9 °C, lower than the 25 °C temperature that may cause thermal shock. Since the maximum effluent temperature is below 25 °C, thermal shock caused by the discharge is prevented or minimized. DEQ did not add a temperature limit or condition as a result of this RPA.

- 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.

Cloverdale STP discharge: The maximum seven day moving average effluent temperature calculated from the Cloverdale facility since DEQ renewed the permit in 2019 was 22.1 °C. The maximum seven day moving average river temperature calculated from 2015 through 2023 was 19.9 °C. An analysis related to migration blockage, included in Appendix A, indicates that when the effluent plume reaches 25% of the receiving stream's cross-sectional area, the plume's temperature will not be above 21.0 °C, and migration blockage caused by the discharge is therefore prevented or minimized. DEQ did not add a temperature limit or condition as a result of this RPA.

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

Table 3-14: Thermal Plume Effluent Limit

Effluent limit needed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Calculated limit: NA
Applicable timeframe: NA
Comments:

3.3.8 Bacteria

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. On May 13, 2002 EPA approved DEQ’s Wilson-Trask-Nestucca Subbasin TMDL. This TMDL established an *E. coli* wasteload allocation for the Cloverdale facility of 406 *E. coli* per 100 mL daily maximum and 126 *E. coli* per 100 mL monthly geometric mean for the summer season. The TMDL established a WLA of 182 *E. coli* per 100 mL daily maximum and 57 *E. coli* per 100 mL monthly geometric mean for the remainder of the year.

The current permit has year-round *E. coli* limits of 182 *E. coli* per 100 mL daily maximum and 57 *E. coli* per 100 mL monthly geometric mean. DEQ reviewed *E. coli* data from monthly discharge monitoring reports for December 2019 through February 2024. During this period the maximum reported *E. coli* value was 172 *E. coli* per 100 mL (June-2021). The average was 8 *E. coli* per 100 mL, trending well below the established limits and indicating the observed maximum was an outlier from typical operations.

The current limits are more stringent than the limits in OAR 340-041-0009(6)(b) and will be retained in the renewal permit. If a single sample exceeds 182 *E. coli* per 100 mL, then the permittee may take five consecutive re-samples at four-hour intervals beginning within 28 hours after the original sample was taken. If the geometric mean of the five re-samples is less than or equal to 57 organisms per 100 mL, a violation is not triggered.

Table 3-15: Proposed *E. coli* Limits

<i>E. coli</i> (#/100 ml)	Geometric Mean	Maximum
Existing Limit	57	182
Proposed Limit	57	182

3.3.9 Dissolved Oxygen

The Nestucca River is listed as impaired for dissolved oxygen during the spawning season (September 15 – June 15) in DEQ’s 303(d) list. DEQ performed a dissolved oxygen (Streeter-Phelps) analysis to determine if the discharge has the potential to cause a measurable dissolved oxygen deficit in the Nestucca River. DEQ considers a dissolved oxygen reduction of less than 0.10 mg/L to be “no measurable reduction”. DEQ applied effluent data from the facility, ambient data from DEQ station 10523 (Nestucca River at Cloverdale) and stream flow and hydraulic geometry data from the 2011 mixing zone study¹ to perform the analysis. Conservative assumptions were made for effluent dissolved oxygen, ammonia and total Kjeldahl nitrogen due to a lack of available data. Additional monitoring for these parameters is proposed in this permit renewal to inform this analysis for future permit renewals. DEQ assumed a value of 5 mg/L for dissolved oxygen and 25 mg/L for ammonia and total Kjeldahl nitrogen levels. The analysis (Appendix B) shows a maximum reduction in dissolved oxygen of 0.01 mg/L occurs seven miles downstream where the river enters the Pacific Ocean. This meets the definition of “no measurable reduction”. There is no need to impose more stringent BOD₅ limits nor ammonia limits.

3.3.10 Toxic Pollutants

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

1. Effluent concentrations and variability

¹ Mixing Zone Modeling Study for Cloverdale Sanitary District. 2011. MixZon, Inc.

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

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

3.3.10.1 Total Residual Chlorine

The existing permit contains chlorine limits. New chlorine limits were calculated based on updated information. The newly calculated limits are more stringent than the existing limits, so the new limits are being proposed. Proposed limits are listed in the following table. A review of DMR data showed that the permittee should be able to meet these limits upon permit issuance and therefore no compliance schedule is needed.

Table 3-16: Proposed Chlorine Limits

	Chronic (mg/L)	Acute (mg/L)
Chlorine Criteria	0.011	0.019
	Average Monthly Limit (mg/L)	Maximum Daily Limit (mg/L)
Existing Limit	0.10	0.25
Calculated Limit	0.09	0.25
Proposed Limit	0.09	0.25
<u>Effluent data source:</u> Current permit maximum daily limit		
<u>Receiving water data source:</u> Assumed to be zero		

3.4 Antibacksliding

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

3.5 Antidegradation

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

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

3.6 Whole Effluent Toxicity

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

3.7 Groundwater

DEQ has not identified any groundwater concerns associated with this facility. Treatment occurs in watertight, above-ground tanks. The asphalt-lined surge basin contains peak flows as needed, and usually remains empty. 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 STP currently manages all of its wastewater solids at the Port of Tillamook Bay. If during the term of this permit the STP decides that it wants to treat and land apply their wastewater solids as biosolids, the facility will need to develop a Biosolids Management Plan. At a minimum, this plan will need to detail that the facility's wastewater solids will meet biosolids pollutant limits defined in OAR 340-050 and 40 CFR Part 503 and will be treated to meet state and federal criteria for pathogen reduction (Class A or Class B biosolids) and vector attraction reduction. The plan will also be subject to public review and comment before it may be implemented.

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

- The biosolids must be land applied at or below agronomic rates.

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

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

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.

6. Schedule C: Compliance Schedule

The permittee is expected to meet all effluent limits once the permit becomes effective and therefore a compliance schedule is not needed.

7. Schedule D: Special Conditions

The proposed permit contains the following special conditions:

7.1 Inflow and Infiltration

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

7.2 Emergency Response and Public Notification Plan

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

7.3 Exempt Wastewater Reuse at the Treatment System

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

7.4 Wastewater Solids Annual Report

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

7.5 Biosolids Management Plan

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

7.6 Wastewater Solids Transfers

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

7.7 Hauled Waste Control Plan

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

7.8 Operator Certification

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

7.9 Industrial User Survey

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

7.10 Outfall Inspection

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

7.11 Boat Ramp Signage

A condition that requires the permittee to post a sign at the Cloverdale boat ramp immediately downstream of the outfall if effluent monitoring shows a bacteria limit exceedance, a disinfection system malfunction, or other treatment plant problems that could adversely affect public health.

8. Schedule F: NPDES General Conditions

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

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

Appendix A: Reasonable Potential Analyses - Temperature

Facility Name: CLOVERDALE STP		Date: 3.26.2024	
OAR 340-041-0053(2)(d)(C): Thermal Shock 25 deg C at 5% of the stream cross section		OAR 340-041-0053(2)(d)(D): Migration Blockage 21 deg C at 25% of the stream cross section	
Enter data into white cells below:		Enter data into white cells below:	
7Q10 = 85 cfs	Data Metric/Source	7Q10 = 85 cfs	Data Metric/Source
Ambient Temperature = 19.9 °C	7Q10 estimate form 2024 MZ Memo	Ambient Temperature = 19.9 °C	7Q10 estimate form 2024 MZ Memo
Effluent Flow = 0.06 mgd	AWQMS, average of 7DADM for June-Oct, ADWDF = 0.04; PF = 0.06 mgd	Effluent Flow = 0.06 mgd	AWQMS, average of 7DADM for June-Oct, ADWDF = 0.04; PF = 0.06 mgd
Max Daily Effluent Temperature = 22.9 °C	Max of 7DADM for May-Oct, 2019-23	Max 7dAM Effluent Temperature = 22.1 °C	Max of 7DADM for May-Oct, 2019-23
5% of 7Q10 = 4.3 cfs		25% of 7Q10 = 21.3 cfs	
5% dilution = 47	dilution = $(Qr \cdot 0.05) / Qe + 1$	25% dilution = 230	dilution = $(Qr \cdot 0.25) / Qe + 1$
Temperature at 5% cross section = 20.0 °C	No Reasonable Potential	Temperature at 25% cross section = 19.9 °C	No Reasonable Potential
		ΔT at 25% Stream Flow = 0.010 °C	

Figure A-1: Temperature Thermal Plume RPA: Thermal Shock & Migration Blockage

Appendix B: Reasonable Potential Analysis for Dissolved Oxygen

Streeter-Phelps Dissolved Oxygen Model		Nestucca River spawn Sept 15 - June 15											
Effluent		Data Entry		all units in mg/L									
entered values		RM	Time	Deficit	Deficit	River Only	River+Source	Source-Ambient	Remaining				
calculated values		(mi)	(days)	CBOD	NBOD	DO	DO	DO Deficit	CBOD	Organic N	NH3-N	Nitrite	Nitrate
Temp (C)	18.5	0.0	0.00	0.00	0.00	11.36	11.35	0.00	1.84	0.485	0.03	0.00	0.00
DO(mg/L)	5	0.3	0.01	0.01	0.00	11.35	11.35	0.01	1.84	0.483	0.03	0.00	0.00
CBOD ₅ (mg/L)	5.35	0.6	0.02	0.01	0.00	11.35	11.35	0.01	1.84	0.481	0.04	0.00	0.00
NH ₃ -N(mg/L)	25	0.9	0.03	0.01	0.00	11.35	11.35	0.01	1.83	0.480	0.04	0.00	0.00
TKN (mg/L)	25	1.2	0.04	0.01	0.00	11.35	11.34	0.01	1.83	0.478	0.04	0.00	0.00
Q _e (mgd)	0.04	1.5	0.05	0.01	0.00	11.35	11.34	0.01	1.83	0.477	0.04	0.00	0.00
K ₁ (@20 C)	0.07	1.8	0.06	0.01	0.01	11.34	11.34	0.01	1.83	0.475	0.04	0.00	0.00
River		2.1	0.07	0.01	0.01	11.34	11.34	0.01	1.83	0.473	0.04	0.00	0.00
Temp (C)	9.66	2.4	0.08	0.02	0.01	11.34	11.33	0.01	1.83	0.472	0.04	0.00	0.00
DO	11.4	2.7	0.09	0.02	0.01	11.34	11.33	0.01	1.82	0.470	0.05	0.00	0.00
CBOD ₅	0.92	3.0	0.11	0.02	0.01	11.34	11.33	0.01	1.82	0.469	0.05	0.00	0.00
NH ₃	0.015	3.3	0.12	0.02	0.01	11.34	11.33	0.01	1.82	0.467	0.05	0.00	0.00
TKN	0.5	3.6	0.13	0.02	0.01	11.33	11.32	0.01	1.82	0.466	0.05	0.00	0.00
Q _r (cfs)	85	3.9	0.14	0.02	0.01	11.33	11.32	0.01	1.82	0.464	0.05	0.00	0.00
K _d	0.14	4.2	0.15	0.02	0.01	11.33	11.32	0.01	1.82	0.463	0.05	0.00	0.00
K _{oa}	0.70	4.5	0.16	0.02	0.01	11.33	11.32	0.01	1.81	0.461	0.05	0.00	0.00
K _{oi}	0.71	4.8	0.17	0.02	0.02	11.33	11.32	0.01	1.81	0.460	0.06	0.00	0.00
K _{on}	0.72	5.1	0.18	0.03	0.02	11.32	11.31	0.01	1.81	0.458	0.06	0.00	0.00
K _s	0	5.4	0.19	0.03	0.02	11.32	11.31	0.01	1.81	0.456	0.06	0.00	0.00
K _r	0.087	5.7	0.20	0.03	0.02	11.32	11.31	0.01	1.81	0.455	0.06	0.00	0.00
Depth(ft)	3	6.0	0.21	0.03	0.02	11.32	11.31	0.01	1.81	0.453	0.06	0.00	0.00
Width (ft)	150	6.3	0.22	0.03	0.02	11.32	11.31	0.01	1.80	0.452	0.06	0.00	0.00
U (fps)	1.74	6.6	0.23	0.03	0.02	11.32	11.30	0.01	1.80	0.450	0.06	0.00	0.00
U (mpd)	28.47	6.9	0.24	0.03	0.02	11.31	11.30	0.01	1.80	0.449	0.07	0.00	0.00
K _a (see comment)	na	7.2	0.25	0.03	0.02	11.31	11.30	0.01	1.80	0.447	0.07	0.00	0.00
K _a (see comment)	3.157	7.5	0.26	0.03	0.03	11.31	11.30	0.01	1.80	0.446	0.07	0.00	0.00
S _B g O ₂ /m ² day	0												
Temperature coefficients													
Theta CBOD	1.047												
Theta O ₂	1.024												
Theta SOD	1.065												
Theta NBOD	1.08												
Rearation equations													
O'Connor Dobbins	3.275												
Churchill (1962)	3.157												
Owens (1964)	4.121												
DO 100% sat													
mg/L	11.36												
Salinity (ppt)													
Elevation (ft)	50												
PARAMETERS													
CBOD ₅	5-day CBOD (mg/L)												
K _d	effective deoxygenation rate (/day)												
K _{cn}	NO ₂ to NO ₃ conversion rate (/day)												
K _{cn}	NBOD reaction rate (/day)												
K _{oa}	Organic to NH ₃ conversion rate (/day)												
K _r	K _d +K _c (/day)												
K _s	settling rate (/day)												
L _N	Initial NBOD (mg/L)												
NH _{3,m}	Ammonia mixed (mg/L)												
NH ₃ -N	ammonia as N (mg/L)												
Norg _m	Organic nitrogen mixed (mg/L)												
Q _e	effluent flow (mgd)												
Q _r	ambient flow (cfs)												
S _B	Sediment Oxygen Demand g O ₂ /m ² day												
Temp	Temperature (degrees C)												
TKN	Total Kjeldahl Nitrogen (mg/L)												
Tmix	Temperature mixed (deg C)												
U	velocity (fps or mpd)												
UBODE (mg/L)	Ultimate effluent CBOD (mg/L)												
UBOD _m (L _N)	Ultimate CBOD mixed (mg/L)												
UBOD _r (mg/L)	Ultimate river CBOD (mg/L)												
Width	Average stream width (ft)												

$$D = D_o \exp(-K_a \frac{x}{u}) + \frac{K_d}{K_a - K_r} \left[\exp(-K_r \frac{x}{u}) - \exp(-K_a \frac{x}{u}) \right] L_o + \frac{K_n}{K_a - K_n} \left[\exp(-K_n \frac{x}{u}) - \exp(-K_a \frac{x}{u}) \right] L_o'' + (1 - \exp(-K_a \frac{x}{u})) \left(\frac{S_B}{HK_a} \right)$$

Figure B-1: Dissolved oxygen reasonable potential analysis (Streeter-Phelps)